

RINGER Master



Aluminium and Steel



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Additional informaiton

The RINGER company is certified according to ISO 9001 -2008

We also produce

- Facade scaffoldings
- Aluminium scaffoldings
- Rolling towers
- Wall formwork MASTER - steel and aluminium (80kN/60kN)
- Slab formwork and concreting tables

Safety regulations for usage of wall formwork

· Preamble

For safe use of the Products you have to follow all relevant regulations and laws of safety authorities of the country in which the Products are used. The User Manual has to be strictly followed as well. They are part of rights and duties regulated between employer and employees in the sphere of labour protection. Installation, dismantling and transportation of the Products have to be done according to these regulations and User Manual. Constant control during installation and dismantling of the system has to be provided.

· User Manual

Formwork is technical equipment that is determined for appropriate industrial usage. Formwork should be used only by qualified personnel with adequate knowledge and qualifications.

User Manual is an integral part of usage of formwork system. It contains safety instructions, usage instructions and system parts description. In user Manual you will also find the drawings with explanations.

· Availability of User Manual

User has to take care that User Manual either from a seller or formwork manufacturer is available at the site and all the personnel is informed and trained accordingly.

· Instructions

Technical and functional instructions from User Manual have to be strictly followed. Deviations from the User Manual require special confirmation (analysis of risk assessment) by User, who has to follow local laws, regulations and safety rules strictly. Otherwise potential risks are high. This is also the case when no original parts of the system are used.

· Illustration

Illustrations that are used in User Manual might not always show all technical details and they are used for reference

· Storage and Transportation

Special requirements for transportation and storage of formwork have to be observed.

· Material Inspection

All formwork material has to be controlled at construction site before each usage at possible faults. The usage of defected formwork material is not allowed.

· Spare parts and Repair

Only system parts are allowed to be used as spare parts. Repair works are to be made by supplier or authorized specialist.

· Usage of other Products

Mixing of formwork components of different origin can be dangerous. Other products have to be controlled and can be used under certain circumstances in case of necessity according to their own assembly and usage manual.

· Risk Assessment

The User is responsible for set up, documentation, implementation and inspection of risk assessment at each construction site. User's personnel are obliged to follow regulations that are fixed by corresponding laws and to follow required procedures that are in their responsibility. User Manual is the basis to evaluate Risk Assessment.

· Instruction for Installation

The User is responsible that written Instructions for Installation is available. User Manual is a basis for Instruction for Installation.

· Symbols

Please take special care for the comments marked with special safety symbols. Examples:



Attention: Nonobservance can lead to health damage or life threatening situation.



Visual control: Conducted activity has to be controlled visually.



Advice: Additional information to safeguard and optimize the usage of the described products.

· Notice: Technical details are subject to change

I) PRODUCT DESCRIPTION:

The Master wall formwork system is a complete system with a wide range of application.

The Alu Master formwork is suitable for minor, manhandled tasks as well as large area applications.

Allowed concrete pressure 60 KN/m²

The Steel Master formwork is a perfect strong system for concreting large areas at one go and to be moved with the crane

Allowed concrete pressure 80 KN/m²

The panel-size grid with 10 different width and 4 different heights gives you the opportunity to master all construction site situations.

The panel frames have profile thickness of 123 mm. The surface of Alu Master is powder coated, Steel Master surface is hot-dip galvanized. All the elements are easy to clean.

The plywood has a thickness of 18 mm. You have the choice between Finnish plywood (both sides coated with reinforced phenolic resin, 13 layers) or plastic coated red plywood (1,8 mm plastic on both sides) that lasts up to 3 times longer than Finnish plywood. The plywood is fixed by rivets and screws.

Alu Master panels can be transported with special pallets that save a lot of space. Smaller parts can be transported in Uni containers.

Master steel is 100% compatible to Master Alu. While waiting for the crane to move steel Master panels, you can go on erecting the formwork with manhandled Alu Master.

The ideal application for Master formwork:



straight walls



circular walls



columns

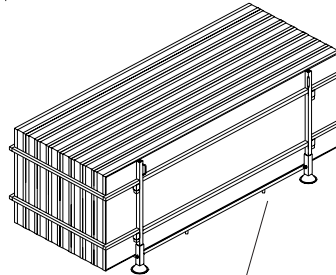
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Gerüste - Baugerüste - Schalungen

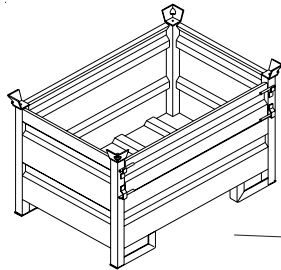
II) The handling of Master formwork:

Transportation:

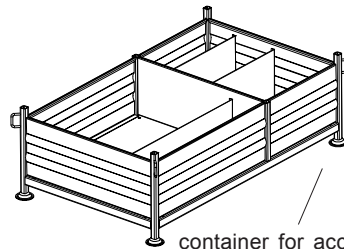
The unloading of Alu Master panels from the truck can be done in pallets, accessories in Uni containers or special containers for small parts. Steel Master panels can be unloaded in staples and separated with lifting chain.



Pallet for Alu panels

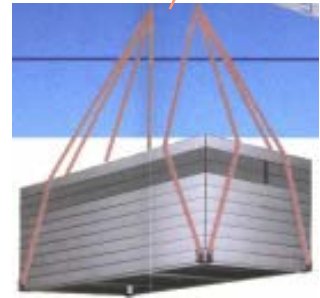


Uni container



container for accessories

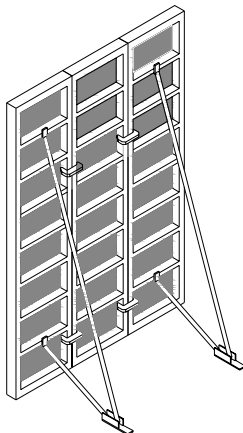
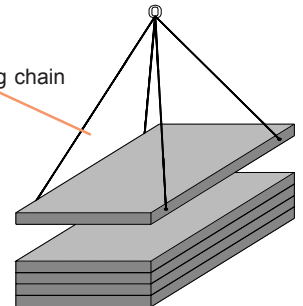
crane transport with STAPOS lifting chain



Erecting the formwork:

Remove bracket from the pallet and spray panels and plywood with Ringer special release agent (it makes easier afterwards to separate panels from concrete).

separating of panels by Master lifting chain



At the site connect panels with Master one hand couplers. Clamp push and pull props to the panels and fix them to the ground. Now the panels can be aligned exactly. With the crane you can erect large blocks of panels, preassembled on the ground.



Attention: before releasing block of panels from the crane, make sure that push and pull props are fixed to the panels to avoid destabilization by wind forces.

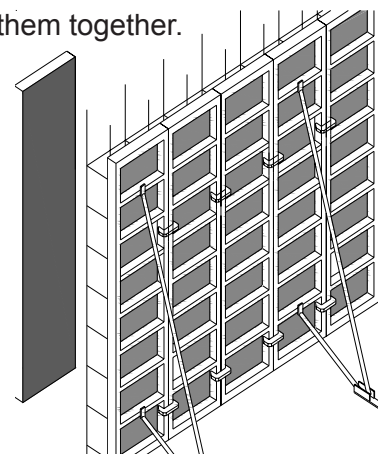
Continue assembling panels or block of panels this way and connect them together.

When one side of the formwork is erected, you can install reinforcement.

Then you can thread in tie rods in the panels of outer side.



Attention: Multi panel blocks should not be released from crane until they are anchored with sufficient amount of anchors, thus protected against falling down.



Concreting:

Alu Master panels have an allowed max. concrete pressure of **60 kN/m²**.

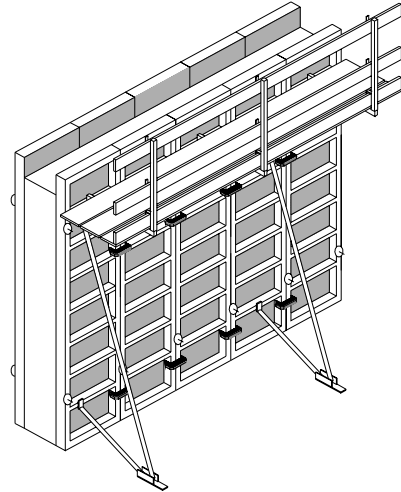
Steel Master panels have an allowed max concrete pressure **80 kN/m²**.

See DIN 18218.

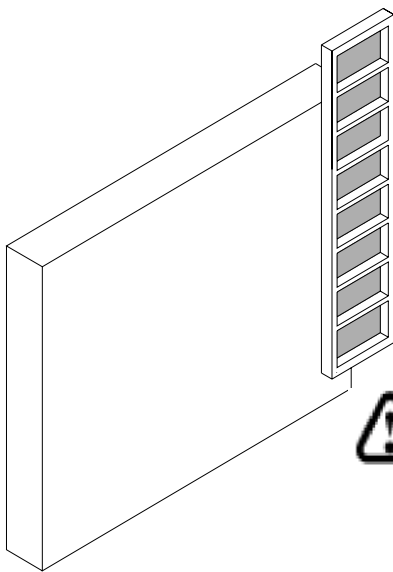
Usage of concrete compactor must comply with DIN 4235.

Pay attention to the climb rate of concrete.

After concreting clean the back side of the panels with water immediately.



Dismantling:



When concrete is freshly hardened , you can begin the dismantling.
Release combi-plates, remove tie rods. Remove Master one hand couplers and bear away the panels.

Clean residual concrete off the panels and spray special release agent.

When dismantling with crane , you can lift the whole multi panel block with push and pull props and concreting or 3S platforms.

Attention: Don't break apart multi panel blocks with crane



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III) Description of system parts:

Panels:

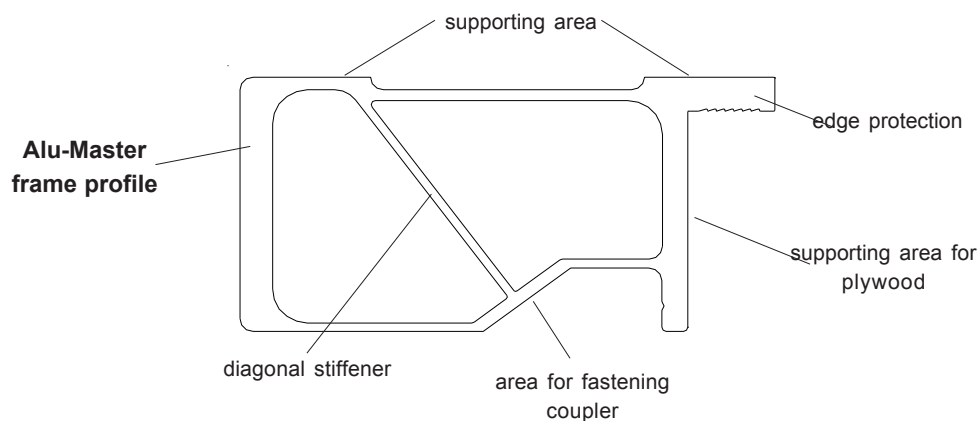
Alu Master Panel:

Alu Master panel consists of dimensionally stable and warp resistant hollow frame profile.

Alu Master panels have an allowed max. concrete pressure of 60 kN/m^2 (DIN 18218). Diagonal stiffener stabilizes the profile and prevents deformation or torsion. There is a stable area on the profile for fastening couplers, stabilized by diagonal stiffener

The frame profile protects plywood and serves for its edge protection.

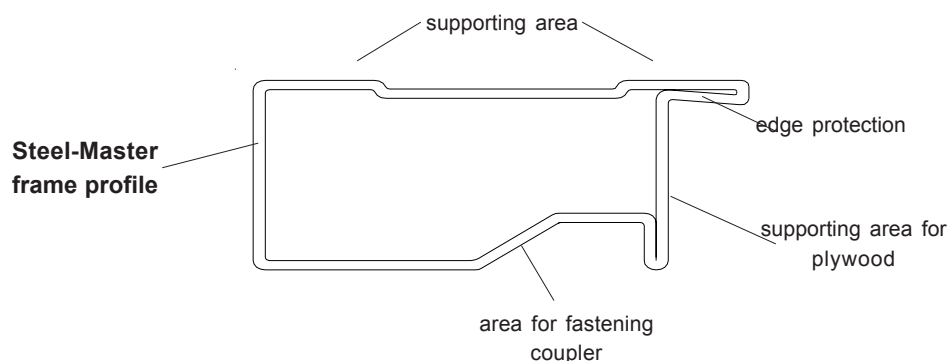
Two supporting areas make it easier to separate panels from each other.



Steel Master Panel:

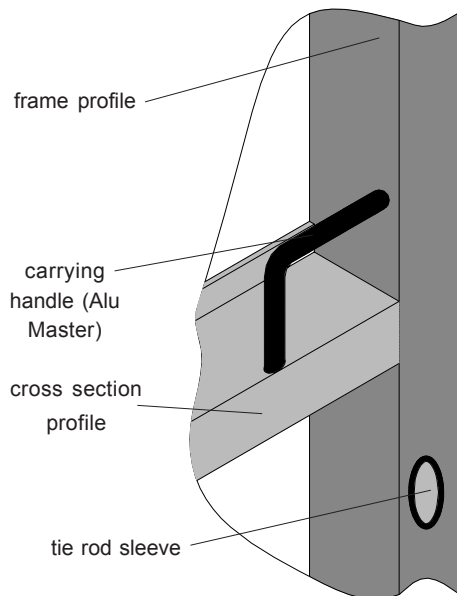
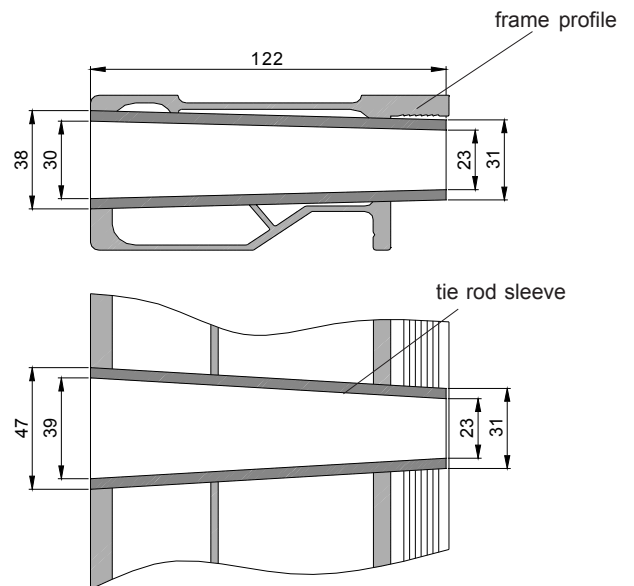
Steel Master panel has only little deviations from Alu Master panel. The profiles are made of rolled sectioned of grain refined steel.

Steel Master panels have an allowed max. concrete pressure of 80 kN/m^2 (DIN 18218).



➡ Advice: When Steel Master panels 135 cm width have concrete pressure of 80 kN/m^2 , tie rods DW 20 should be used!

Master panels have 4 (with height 3,30 m 6 pcs) tie rod sleeves welded in profile. They are conical and therefore tie rods are very easy to thread in. Conical tie rod sleeves enable the panels to be tilted on one or both sides and offset to different heights.



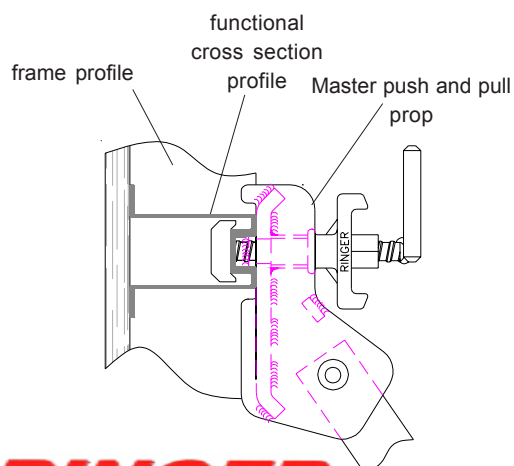
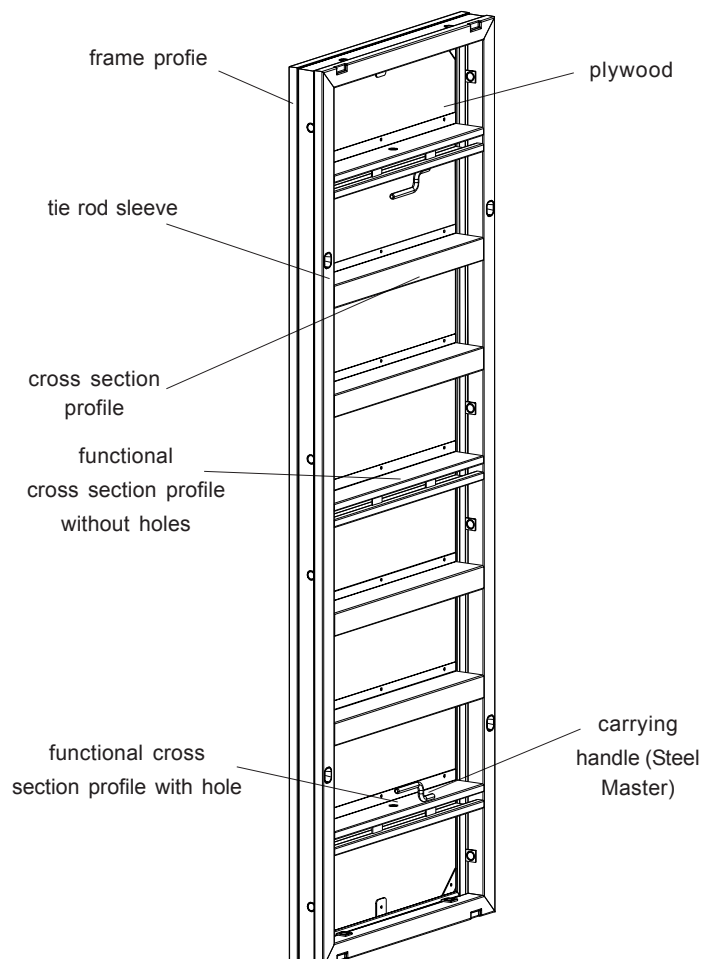
4 carrying handles, welded on the edge and cross section profiles make the handling of Alu Master panels very easy (see picture to the right)

Cross section profiles have function of stiffening frames and supporting plywood.

Panels are available with Finnish plywood or plastic coated plywood. Plywood is fixed with screws and rivets to the cross section profiles.

Functional cross section profile is ideal for fixing accessories as RS clamps, push and pull props, etc.

Functional cross section profile has drilled holes to fix brackets of concreting platforms.

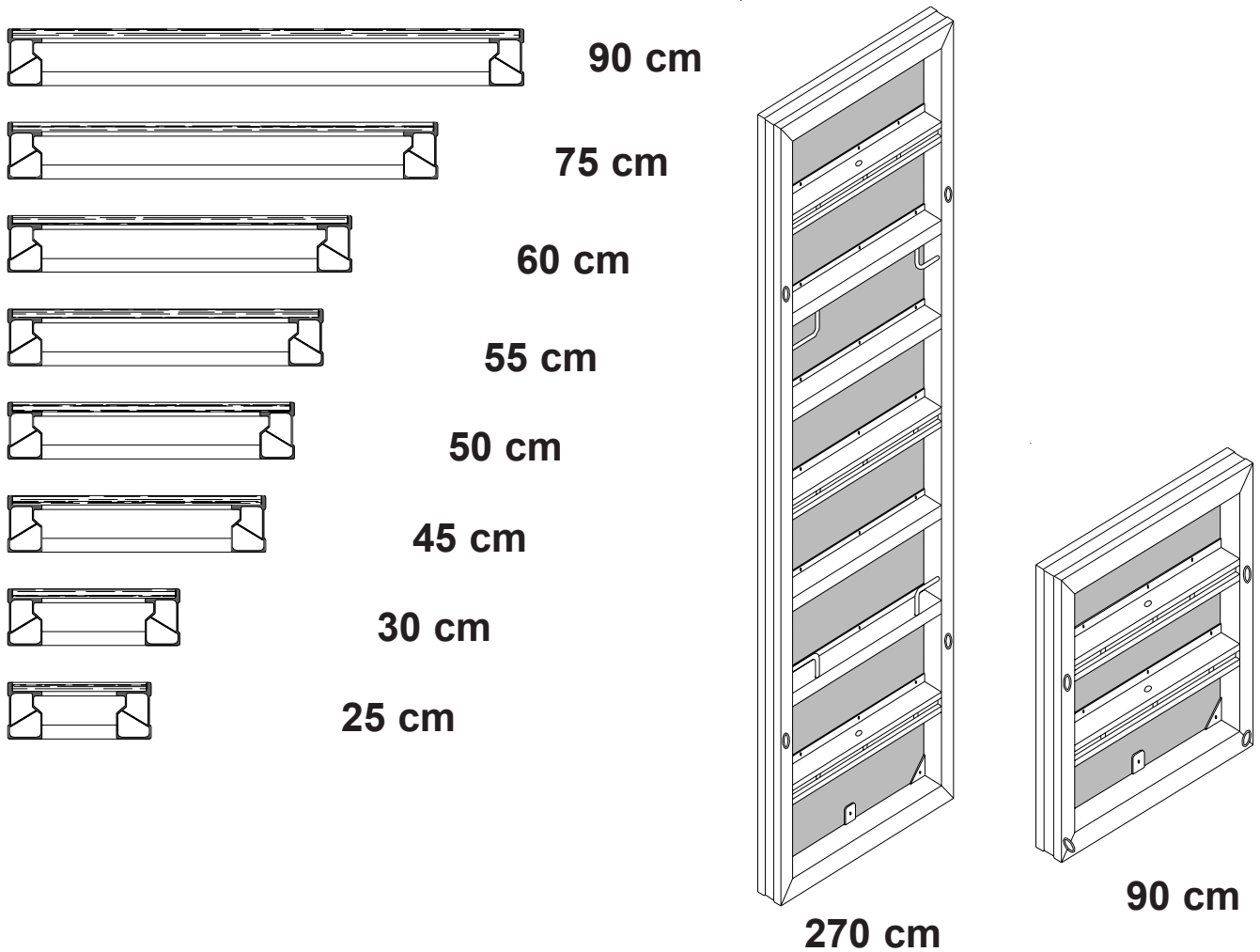


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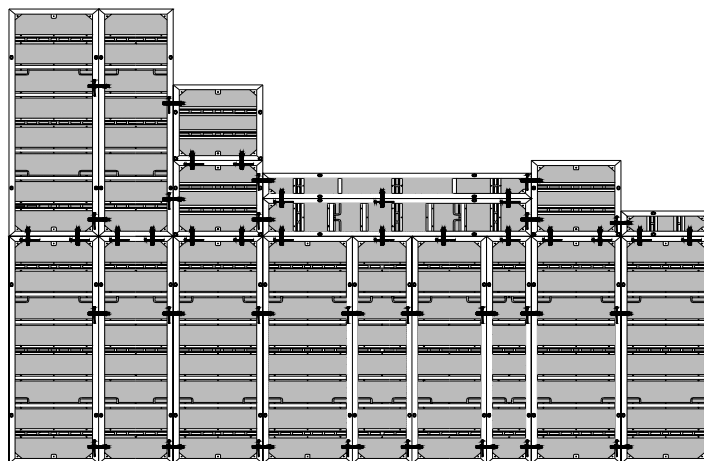
System grid:

With the widths and heights of different Master panels you can shutter any shape.

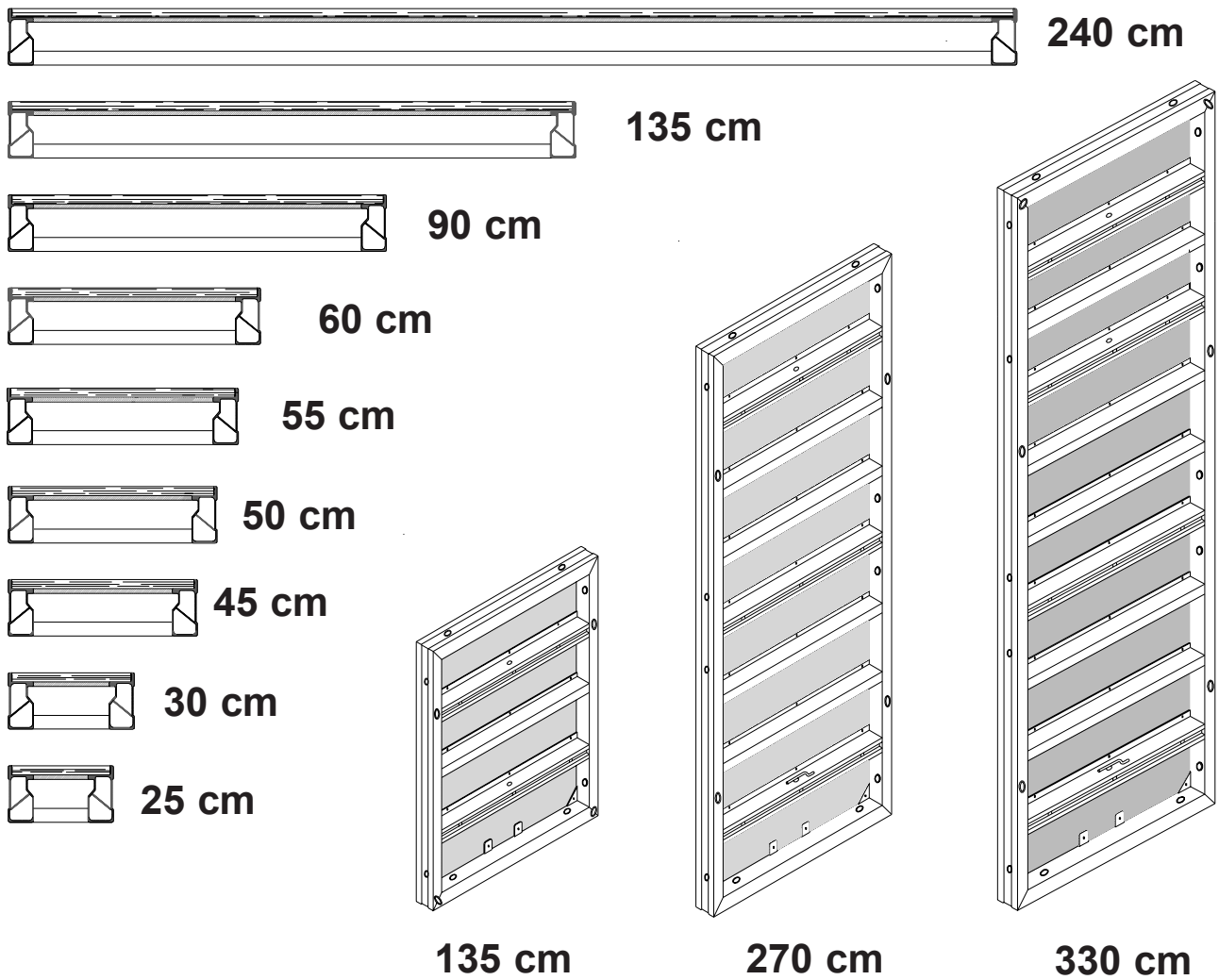
Alu-Master - formwork: 8 panel widths , 2 panel heights



Due to the ideal system grid you can combine panels lying or standing. That makes Master system flexible and adaptive.



Steel Master - formwork: 9 panel width, 3 panel heights



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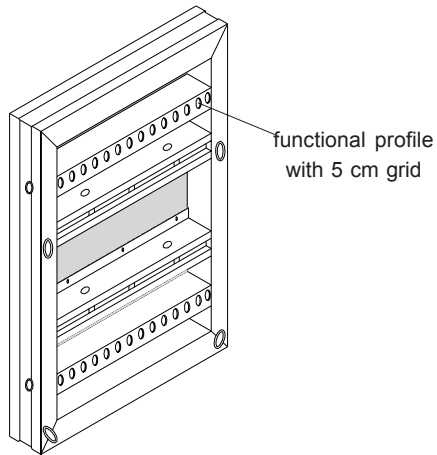
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Master multi purpose panels:

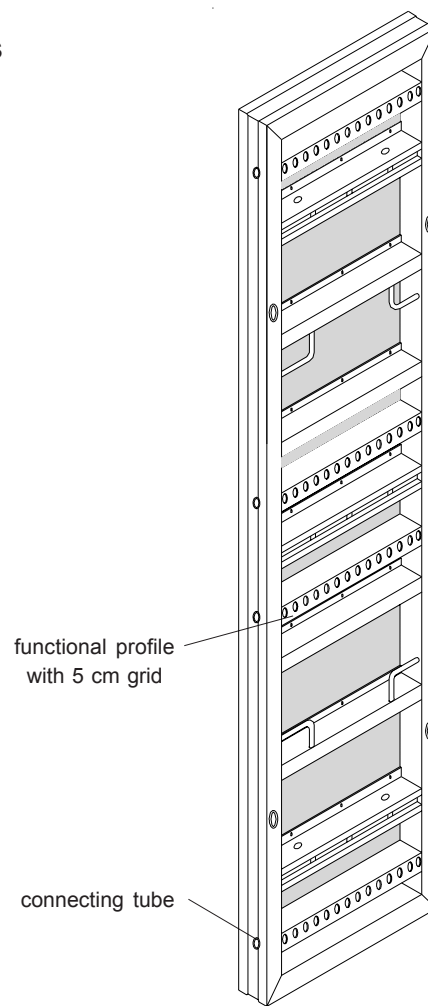
Suitable for casting columns, corners, wall connections and stop ends.

Alu Master multi purpose panels:

There are 2 heights in 75 cm width:



90 cm

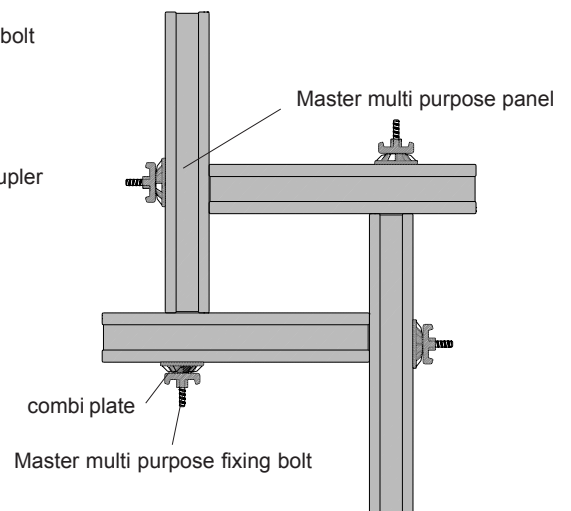
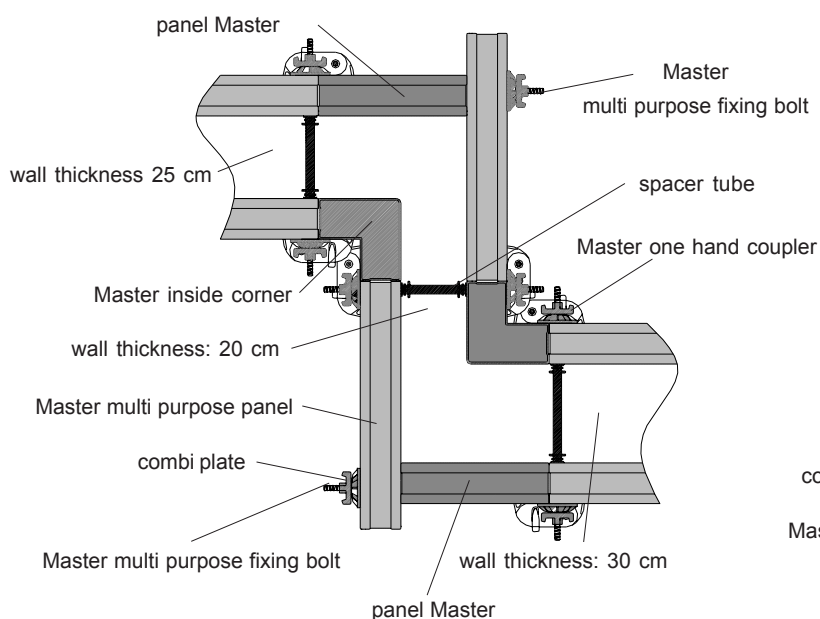


270 cm

5 cm pattern makes it possible to cast different wall thickness and cross sections of columns from 20 to 60 cm



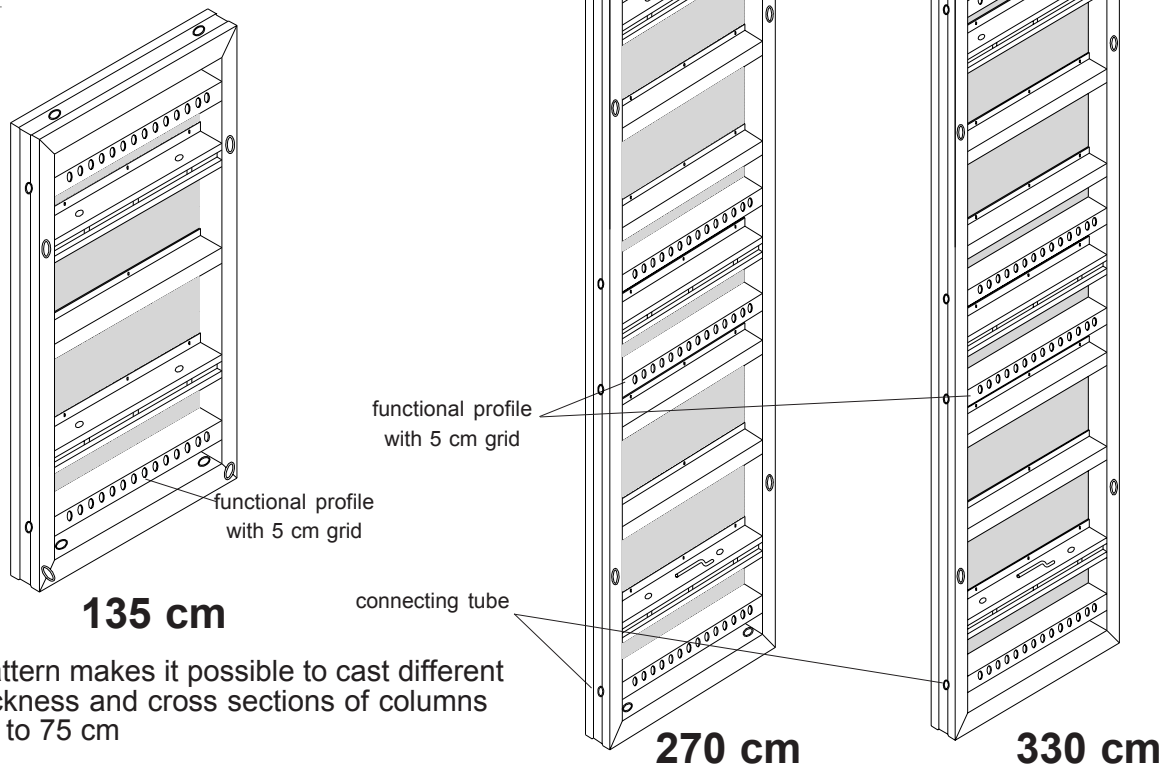
Advice: please close holes that are not in use with brown tie cones



Steel Master multi purpose panel

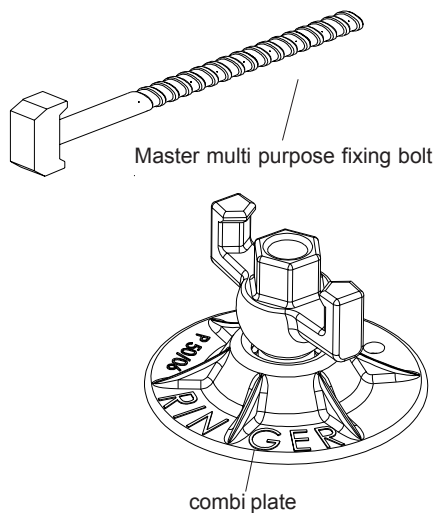
There are 3 heights in width 90 cm of Steel Master multi purpose panels available.

It is recommended to use crane to move Steel Master multi purpose panels.



5 cm pattern makes it possible to cast different wall thickness and cross sections of columns from 20 to 75 cm

You need only Master multi purpose fixing bolts and combi plates to connect panels.



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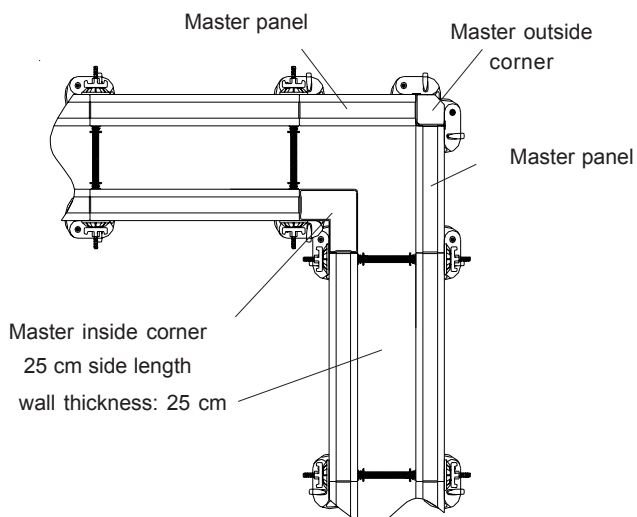
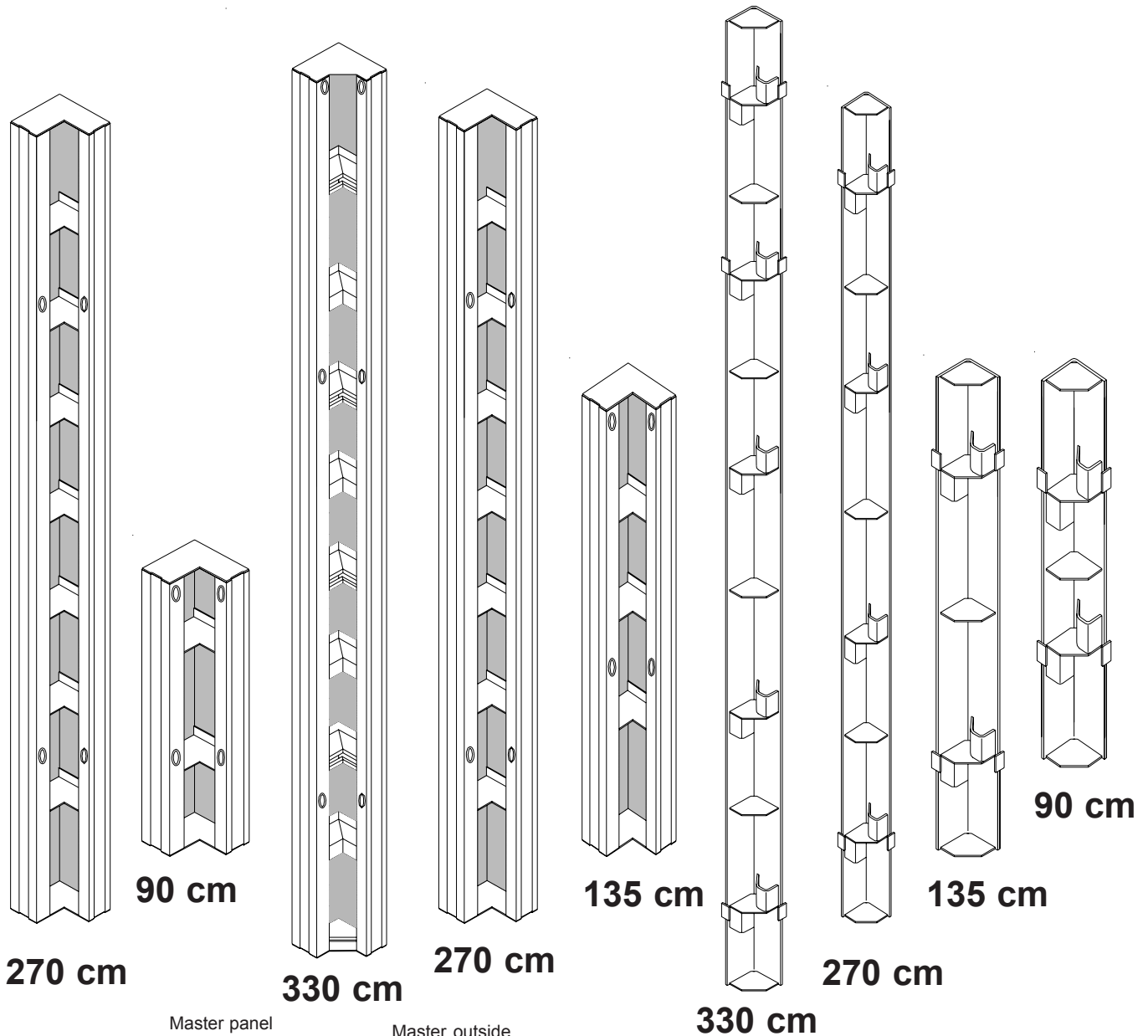
Master corners:

90° corners can be built up with Alu/Steel Master inside and outside corners that are available in the following heights:

Alu Master inside corner

Steel Master inside corner

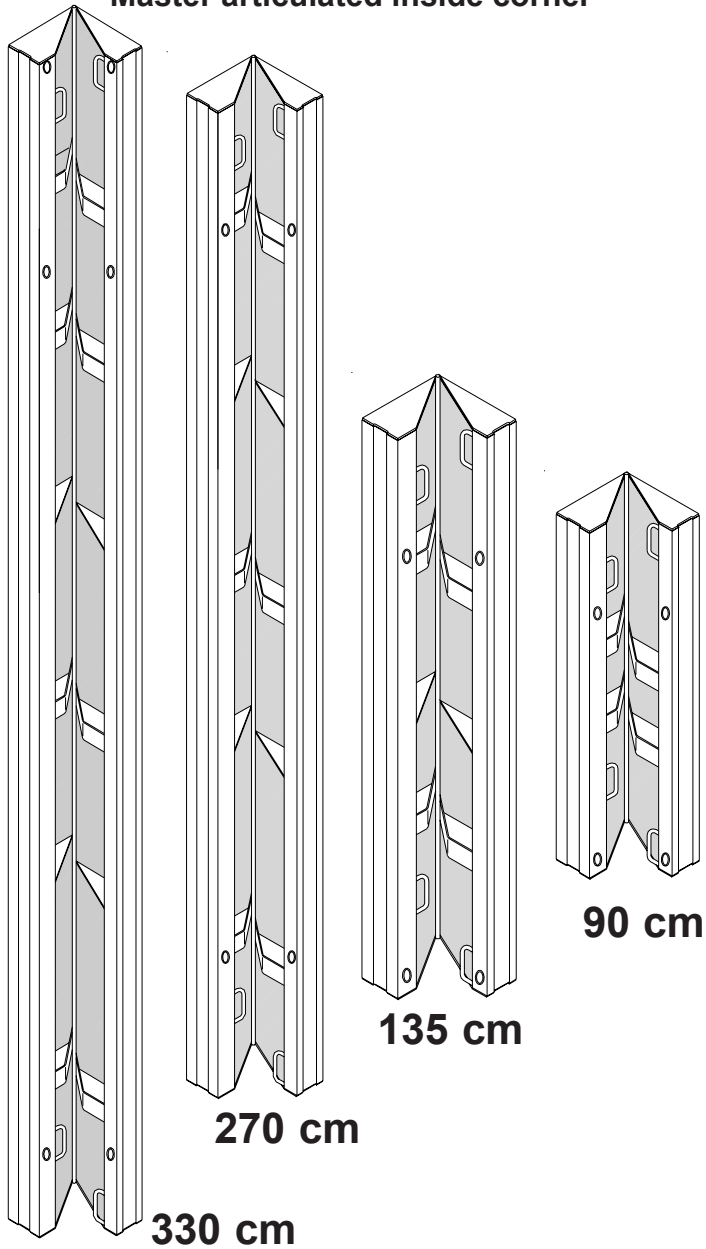
Master outside corner



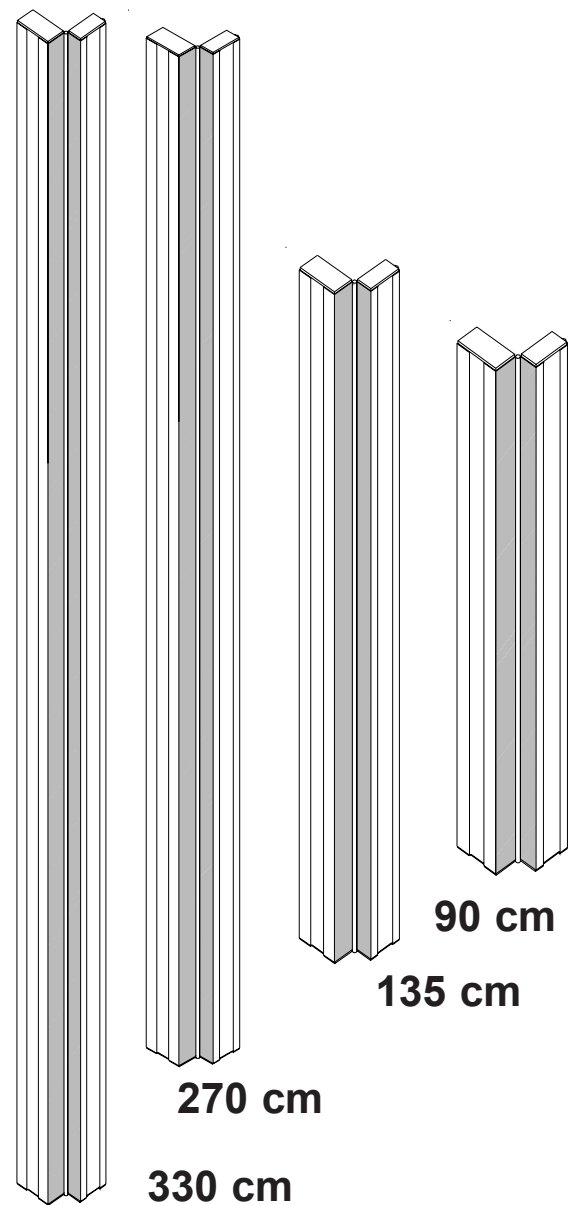
Alu Master inside corners have leg length of 25 cm and 30 cm (length 30 cm with plywood). Steel Master inside corners have leg length 30cm. On the left picture the usage of outside corner with corresponding wall thickness is shown.

For varying corners 60° - 180° inside and outside articulated corners are used.

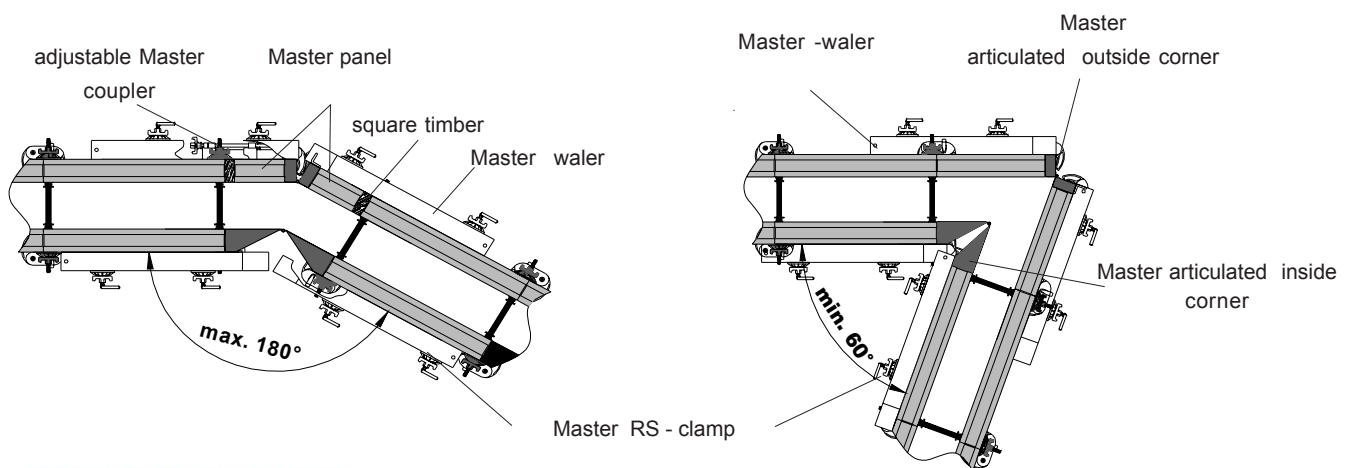
Master articulated inside corner



Master articulated outside corner



Master articulated corners are available in heights 330 cm, 270 cm, 135 cm, 90 cm. Inside articulated corners have leg length of 30 cm; outside articulated corners have leg length of 6 cm.



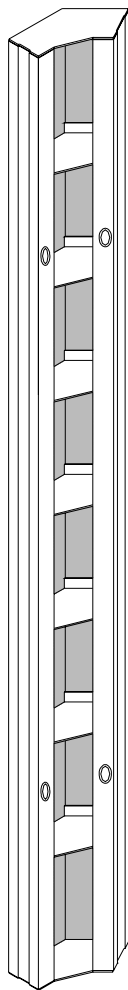
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Geräte - Baugüter - Lösungen

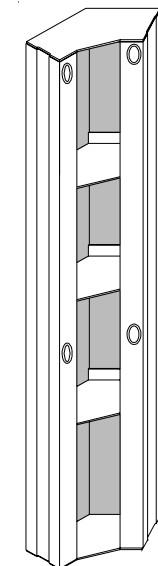
You can build 135° corners using special 135° corners in system Alu Master.
 These corners are more stable and wrap resistant then articulated corners, that is why no additional walers are required.

135° corners are made that way, when casting a wall with 25 cm thickness they are fixed together so that you do not need any additional panels (see picture below).

Alu-Master inside corner 135°

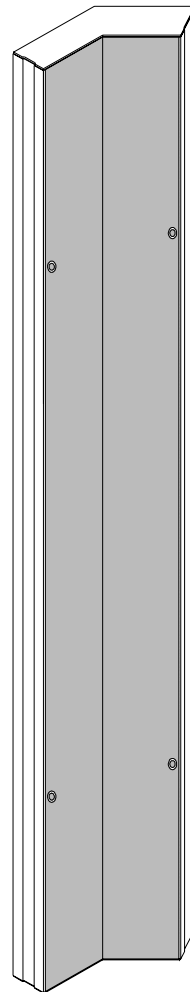


270 cm

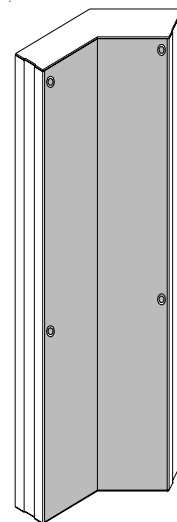


135 cm

Alu-Master outside corner 135°

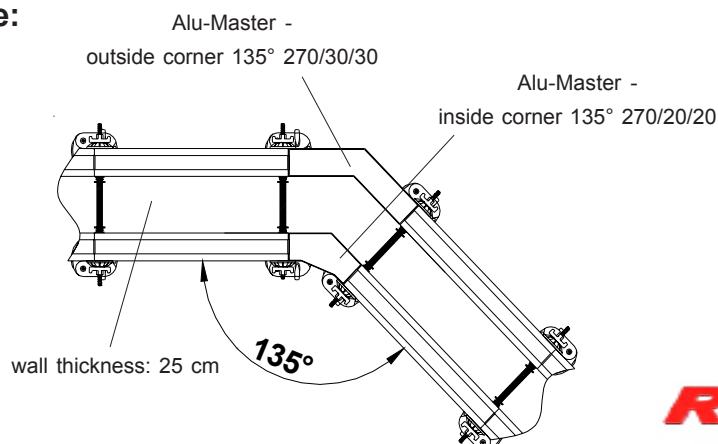


270 cm

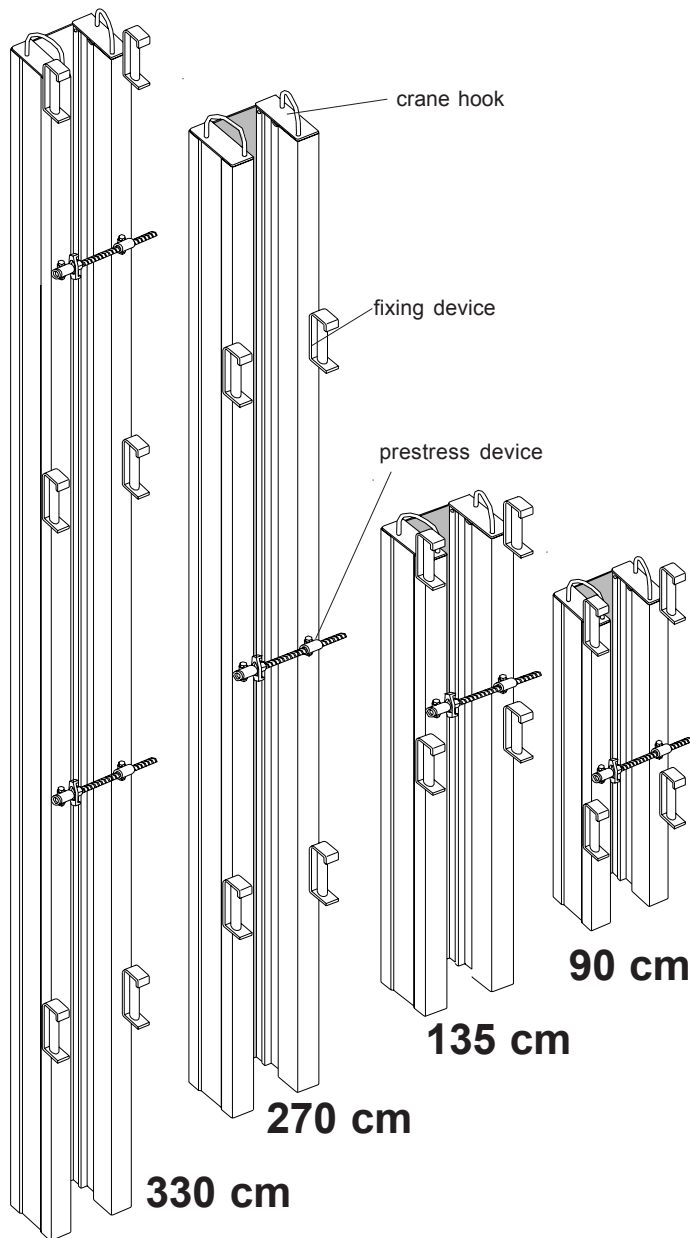


135 cm

connection sample:



Master circular forming plate:



With Master circular forming plates you can cast circular walls in a polygonal way.

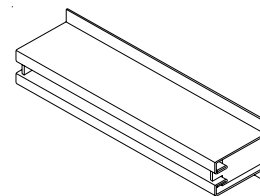
Use Master circular forming plates together with standard Master panels.

You will get the required radius by adjusting the prestress device.

Minimum inside radius: 1,80 m

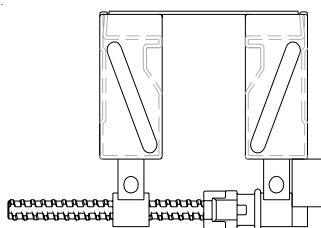
The connection of circular panels with standard panels is made with Master one hand couplers.

Fit in tie rod in the middle of the circular forming plate, fix with Uni waler 40 and combi plates.



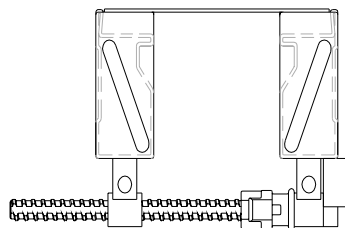
Uni waler 40

The circular forming plates are available for Master system in heights of 330 cm, 270 cm, 135 cm and 90 cm and widths of 20 cm, 25 cm and 30 cm.



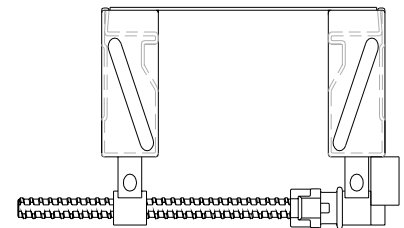
20 cm

Inside circular forming plate
or
outside circular forming plate



25 cm

outside circular forming plate



30 cm

outside circular forming plate

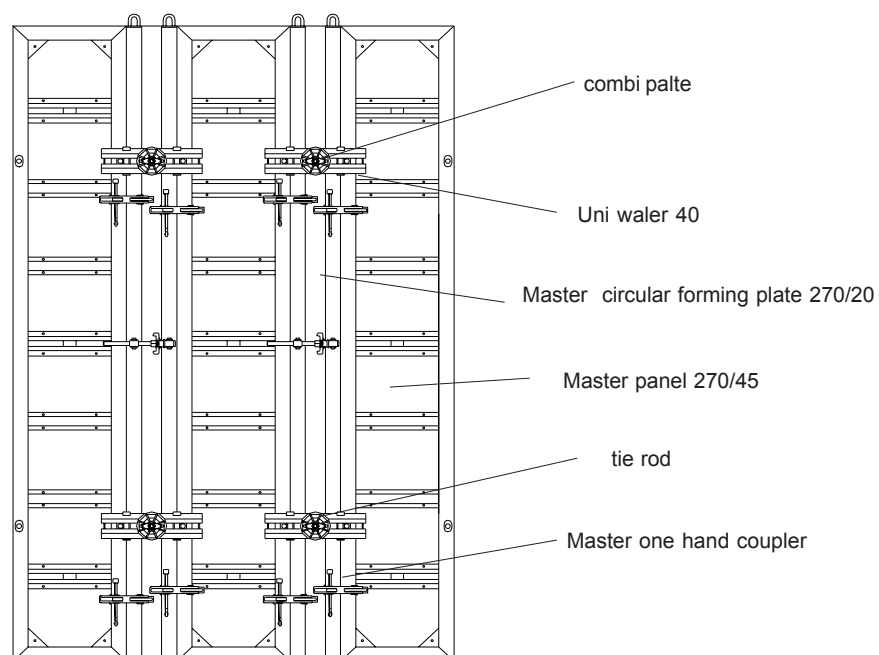
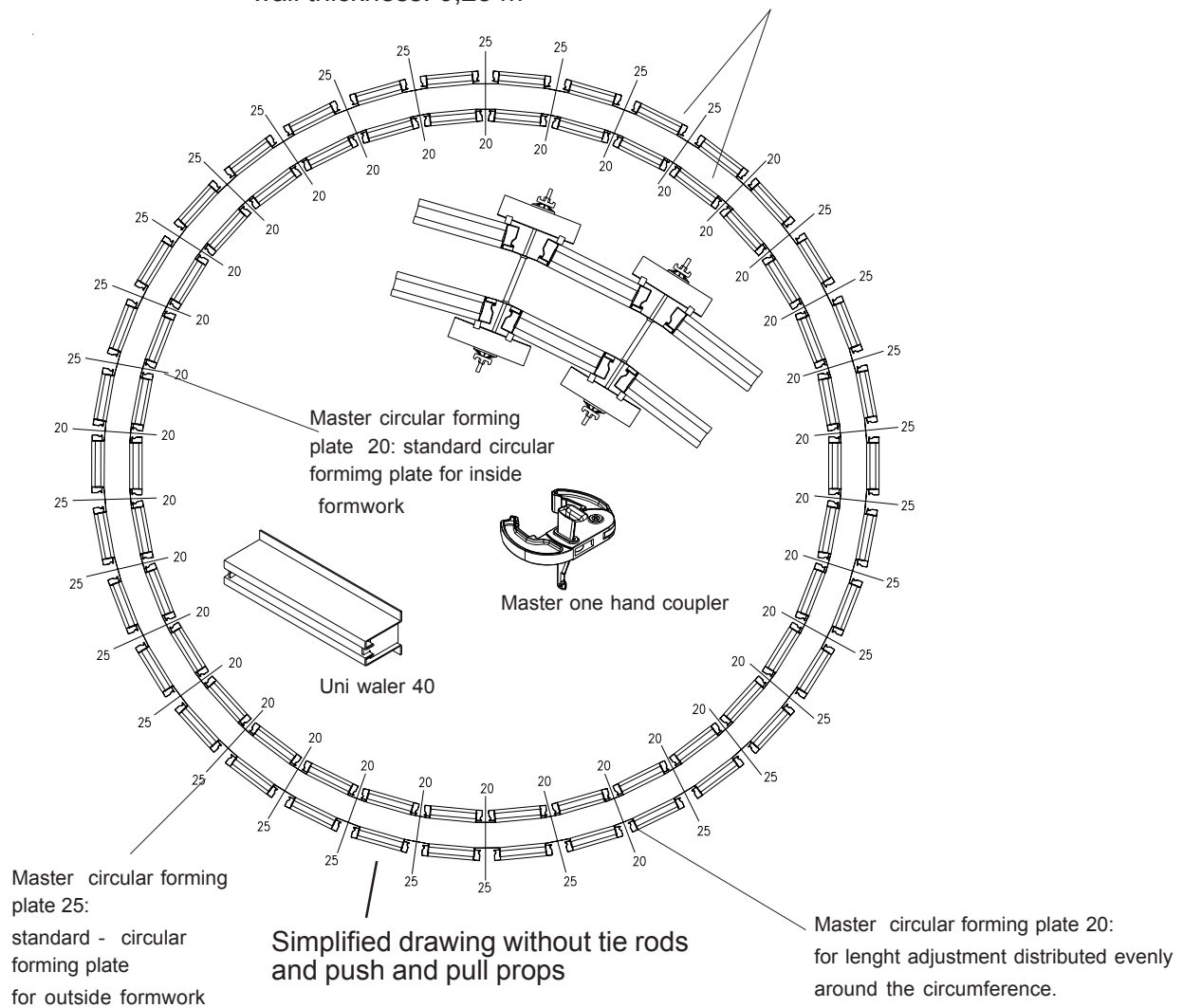
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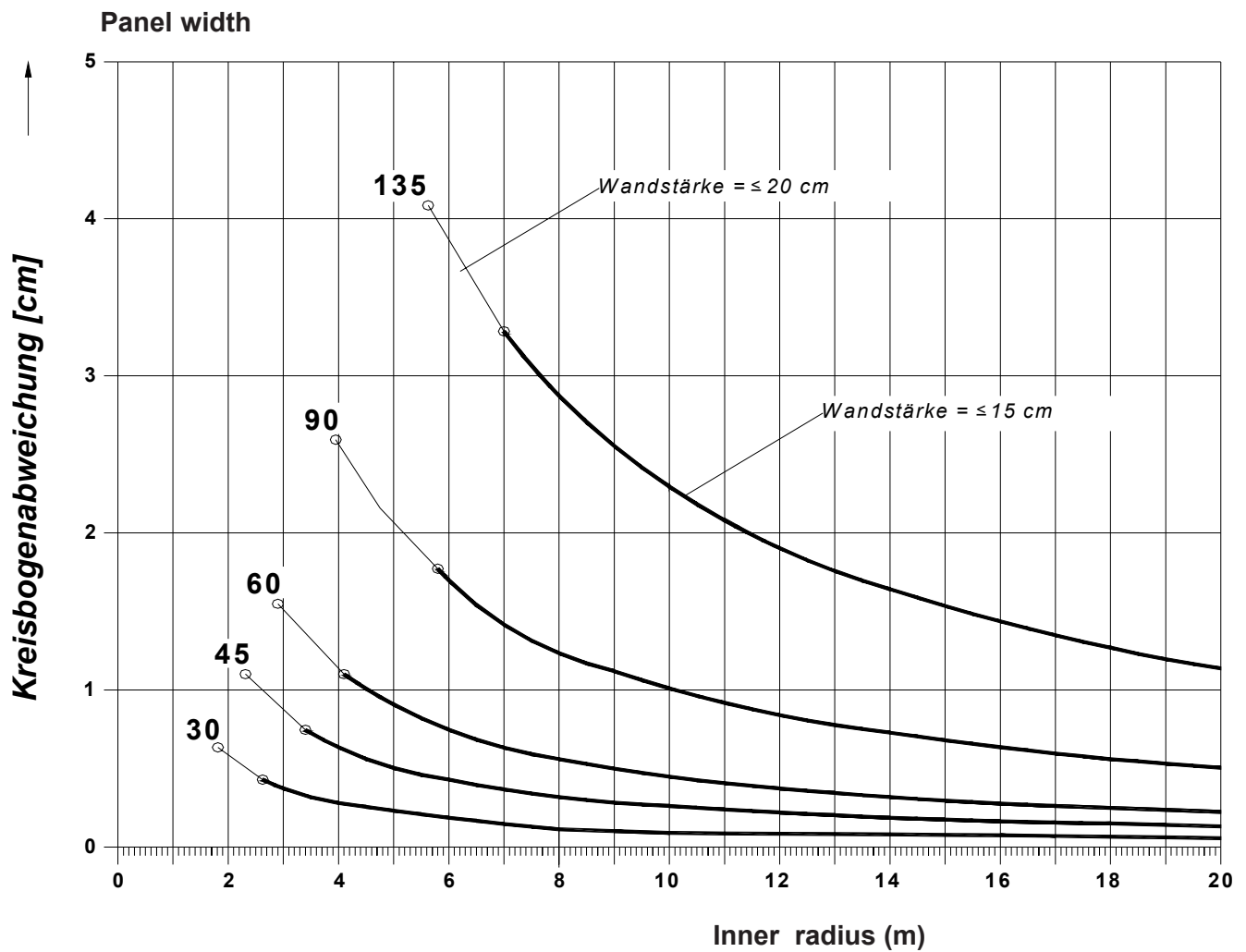
Example:

Circular waste water tank: inside radius: 3,50 m
wall thickness: 0,25 m

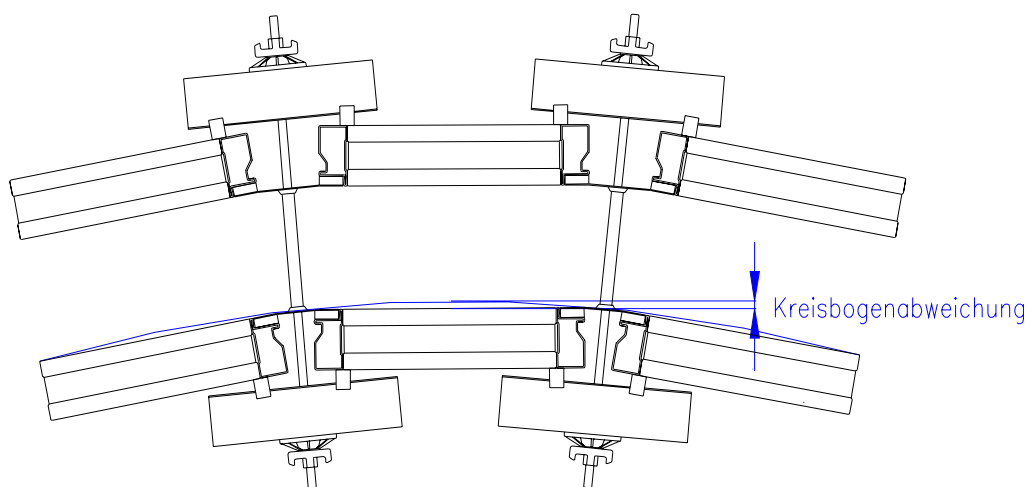
Master panels 270/45:
are used for inside as well as outside



Radius segment diagram:



This radius segment diagram is to determine maximal panel width and permitted deviations from circular arc.



Calculation of the best distribution of panels:

Data

Inside radius [cm]
Outside radius [cm]
Length of concreting section [cm]

Choice of panel width [cm]

Check permitted segment dimensions
in the radius segment diagram.

For inside formwork

Take circular forming plate 20 cm

Quantity of panels calculation

$$\frac{(\text{length of concreting section} - \text{panel width})}{(\text{panel width} + 20)} = \dots$$

The result is the quantity of Master circular forming plates required for one side of formwork.
The quantity of standard panels should be 1 piece more than quantity of circular forming plates.

Example:

Inside radius: 450 cm
Outside radius: 475 cm
Length of concreting section :
943 cm
(1/3 of inside perimeter)

Panel width selected :
60 cm

$$\frac{(943 - 60)}{(60 + 20)} = 11$$

Quantity circular forming plates: 11
Quantity standard panels: 12

Determining of the distribution of Master circular forming plates for outside formwork:

$$\frac{\text{outside radius}}{\text{inner radius}} \times (\text{panel width} + 20) - \text{panel width} = \dots$$

The next smaller Master circular forming plate is selected as „Type 1“
Insert the difference in the formula below and you get the number of Master circular forming plates "Type 1".

$$\text{qty of circular forming plates} \times \left(1 - \frac{\text{difference}}{5}\right) = \text{qty "Type 1"}$$

By subtracting the quantity of "Type 1" from the selected quantity of circular forming plates, you get the number of circular forming plates "Type 2".

"Type 2" is the next larger circular forming plate

$$\frac{475}{450} \times (60 + 20) - 60 = 24,44 \text{ cm}$$

Circular forming plate "Type 1" = 20 cm

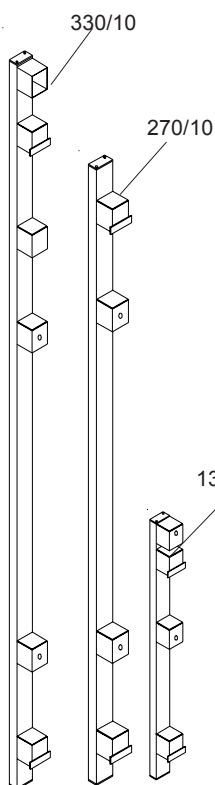
Difference = 4,44 cm

$$= 11 \times \left(1 - \frac{4,44}{5}\right) = 1,23$$

2 circular forming plates "Type 1" (20 cm)
9 circular forming plates "Type 2" (25 cm)

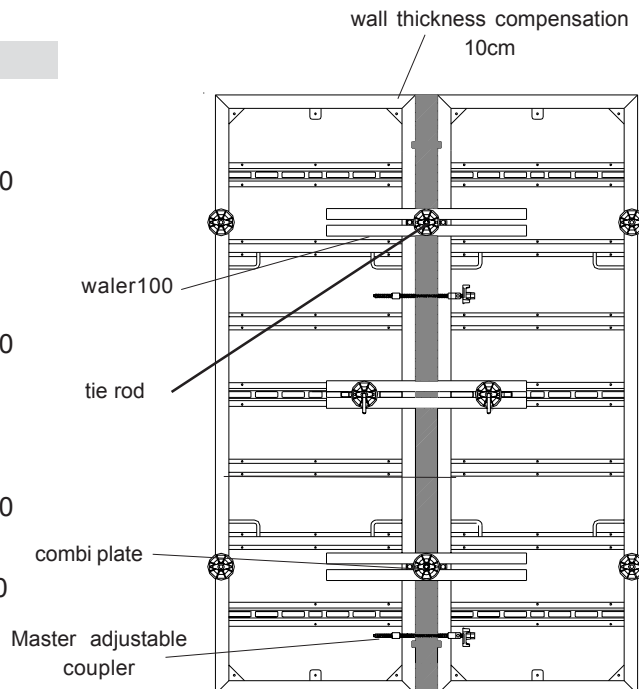
Master wall thickness compensation:

This is the best alternative to fitting timber compensations. For compensation up to 5 cm only 2 adjustable couplers and no other additional parts are required. For compensations from 5,1 cm, 2 adjustable couplers, 3 Master walers 100 with 6 RS clamps are required.



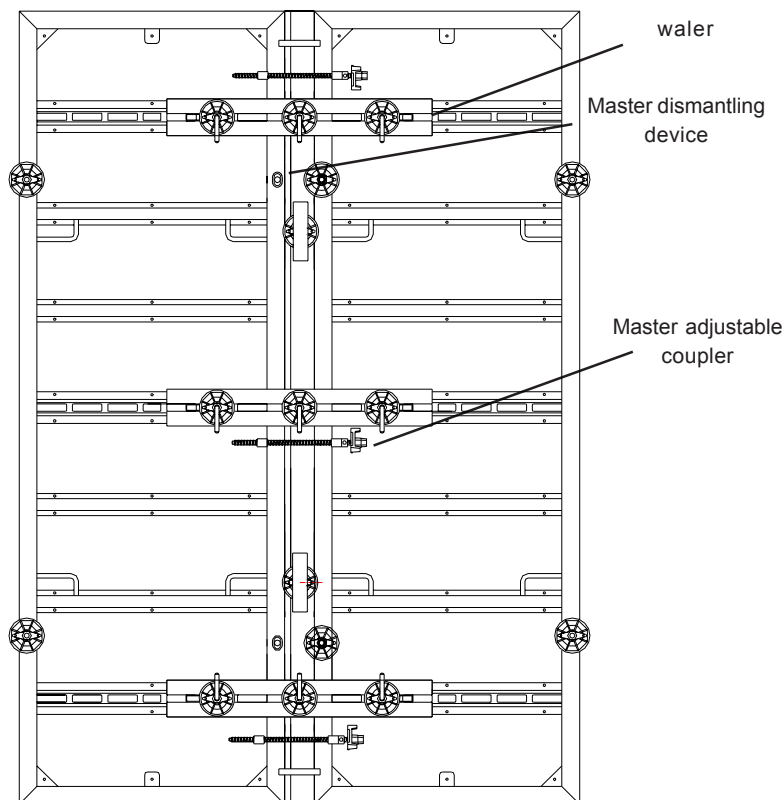
sizes:

Wall thickness compensation 330/10
 Wall thickness compensation 330/5
 Wall thickness compensation 330/3
 Wall thickness compensation 330/2
 Wall thickness compensation 270/10
 Wall thickness compensation 270/5
 Wall thickness compensation 270/3
 Wall thickness compensation 270/2
 Wall thickness compensation 135/10
 Wall thickness compensation 135/5
 Wall thickness compensation 90/10

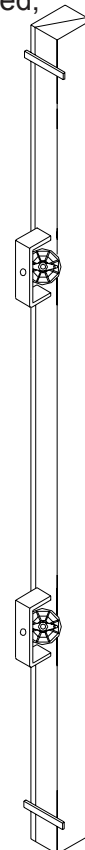
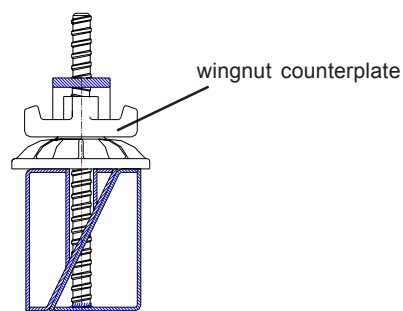


Master dismantling device:

Master dismantling device is used to make the dismantling of lift shafts, staircases etc. easy and quick. Available heights are 270 cm and 135 cm. It is fixed with 3 Master adjustable couplers, 3 walers 100.



After wingnut counterplates are released, both halves are separated and you can dismantle easy.



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EASY SOLUTION FOR LIFT SHAFTS

Innovative solution for inside formwork of lift shafts

Due to the mechanism that is used in dismantling corner, formwork can be released from concrete very quickly and it can be moved further in complete block.

Usage (shifting) is effected with help of:

- adjustable spindle, whereas tie rod DW15 or ratch can be used
- crane, while lifting adjustable bar

Attention: Bolts of adjustable spindle must be removed!



Height extension:

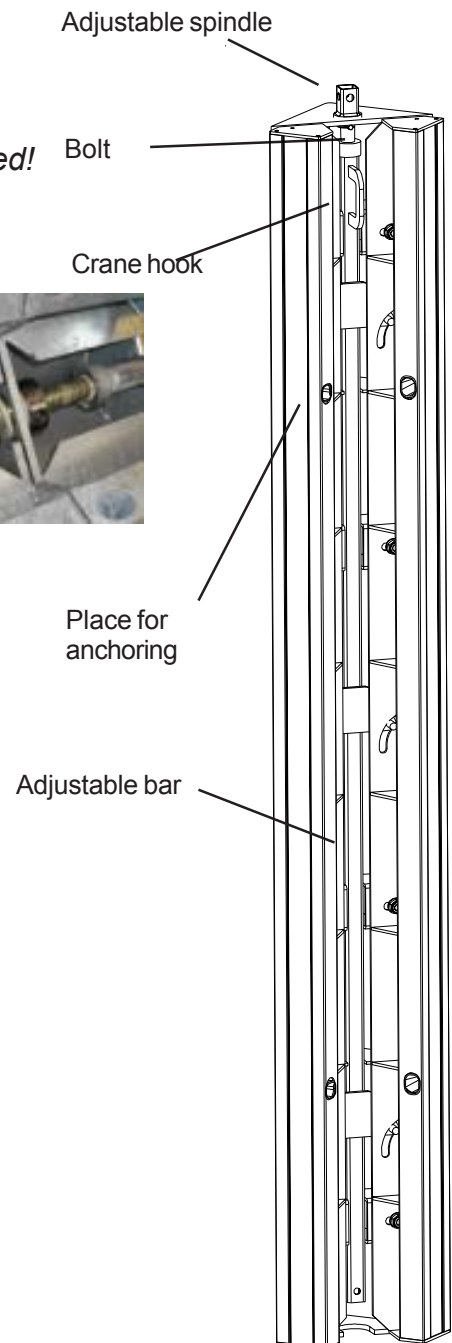
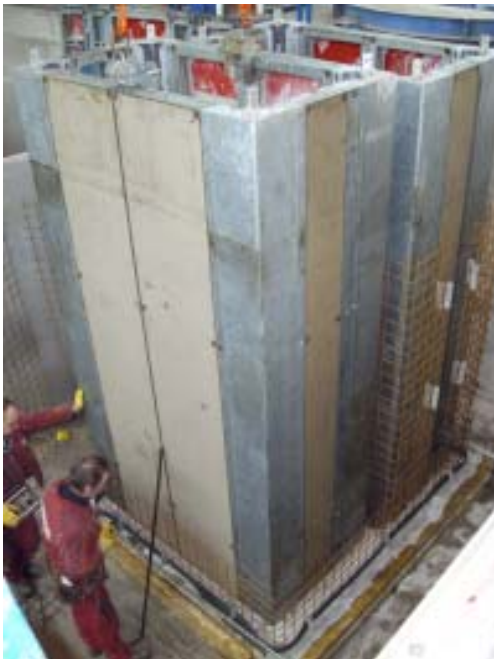
For height extension of formwork, remove bolt from adjustable spindle and use it as connecting bolt to fix upper dismantling corner, when inserting this bolt in the hole of adjustable spindle of the upper corner.

Height of dismantling corners:

Heights 1,35, 2,70 and 3,30 m are available, max. height extension up to 5,4m is possible



Advice: For connection use only UNI couplers!

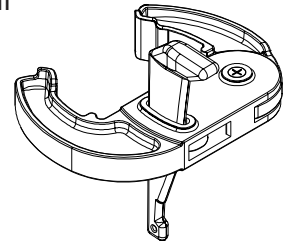


Master connection devices:

Master panels are connected with Master one hand couplers. By panel height of 2,70 m only 2 one hand couplers to connect the panels are required. For Master outside corner height 2,70 m 8 one hand couplers are used, i.e. 4 couplers for each side.

To connect Master panels 3,30 m height 3 one hand couplers are required and for outside corner 3,30 m height 12 couplers are used.

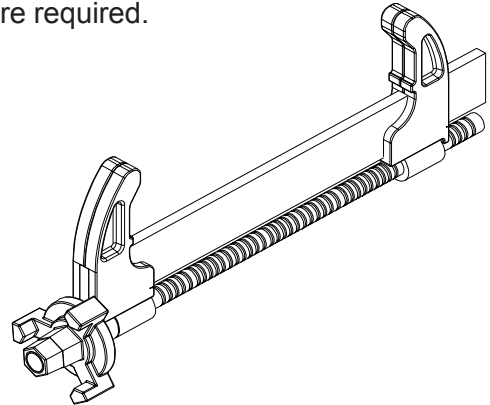
Master one hand coupler is a self closing device that is why you can fix the coupler using one hand only. With a single blow of hammer you create a fast, self aligning and tension proof joint.



For compensation of distances up to max. 20 cm Master adjustable coupler is used.

The distance between two jaws of the coupler is changed by tie rod DW 15.

By panel height up to 2,70 m 2 pieces and by panel height 3,30 m 3 pieces of adjustable couplers for length compensation or in-line connection are required.



Master truing adjustable clamp

For compensation of distances up to max 10 cm Master truing adjustable clamp can be used.

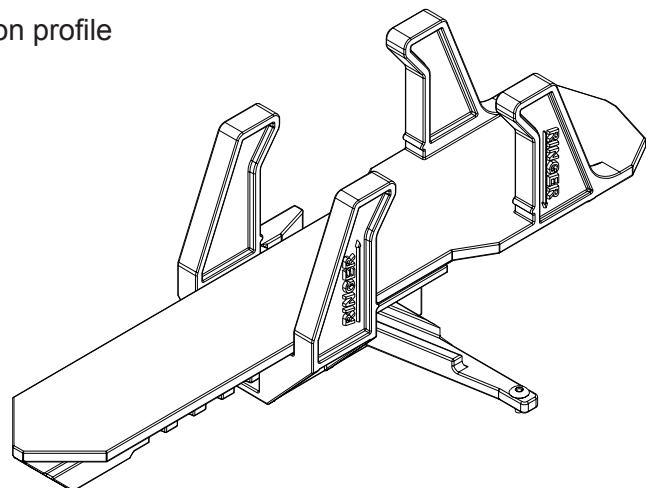
Advantage: Clamp also acts to align formwork panels.

By compensation of less than 5cm no walers are required.

By panel height up to 2,70 m 2 pieces and by panel height 3,30 m 3 pieces of truing adjustable couplers for length compensation or in-line connection are required.



Advice: The coupler is to be fixed at cross section profile



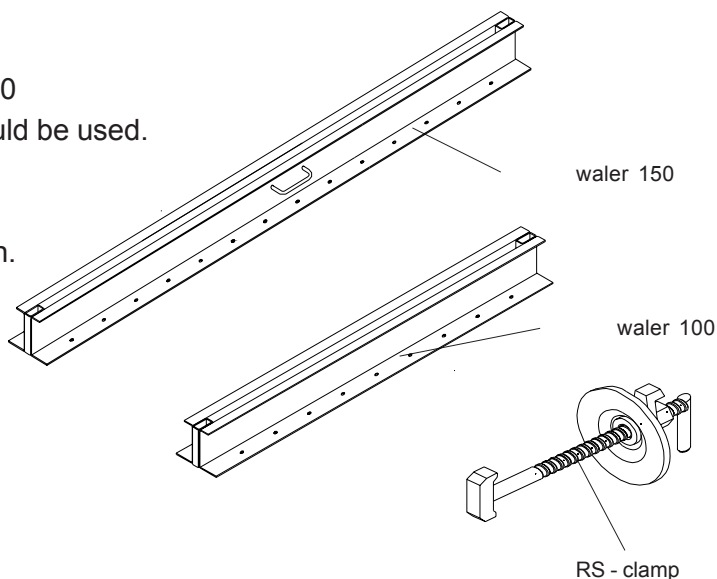
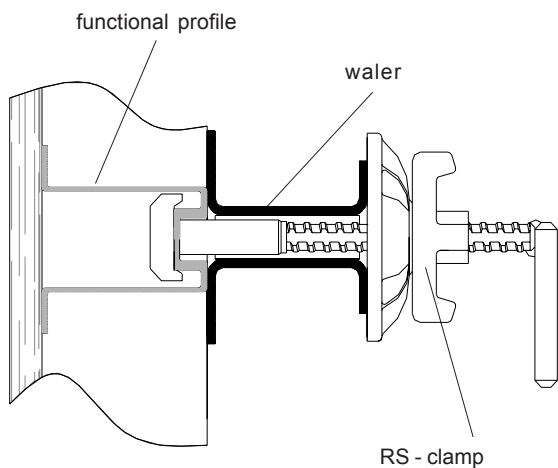
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Gerüste - Baugerüste - Schalungen

Master waler:

For vertical stacking Master waler 150 for stiffening the block of panels should be used.

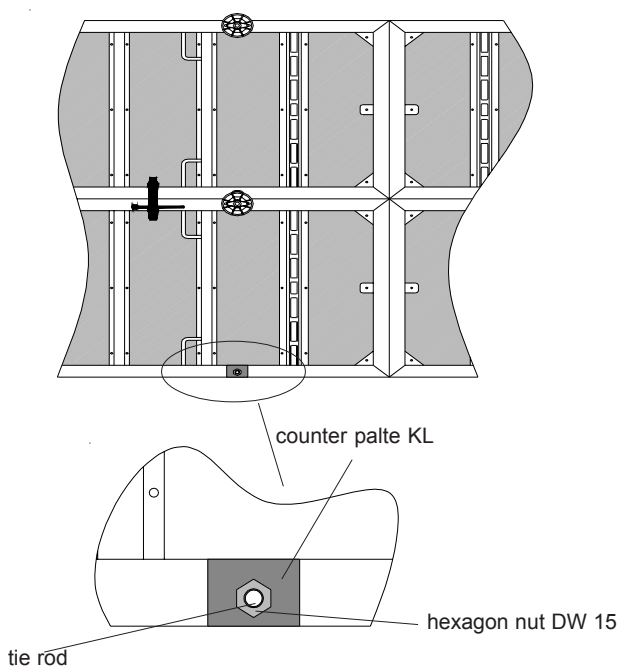
Master waler 100 is used mainly for compensation and in-line connection.



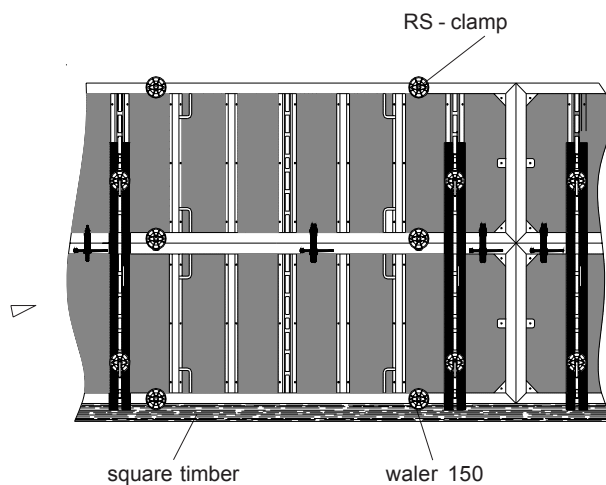
Fix walers with Master RS clamps to functional profile. Per each waler 2 RS clamps are required. Walers can also be fixed by anchors.

If panels are assembled horizontally without square timber, a hexagon nut DW 15 + a counter plate KL instead of a combi plate should be used.

without square timber



with square timber



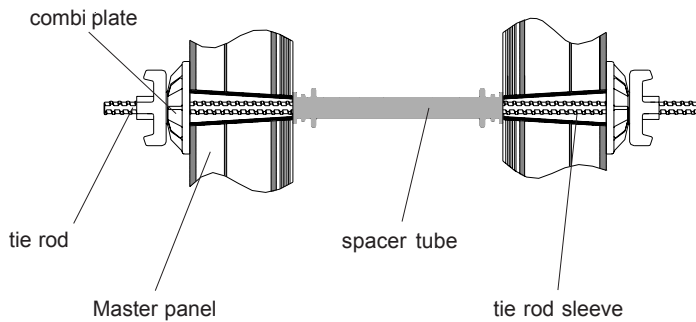
Anchoring:

The anchoring of Master panels is done with tie rods with 2 combi plates.

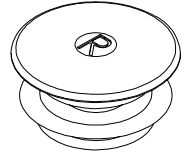


ATTENTION: use only certified tie rods!

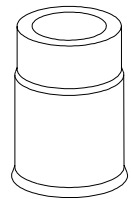
Do not weld or heat tie rods, they can break!



uni tie cones
for sealing unused holes
in panels.



cone space tubes
for sealing spacer tube.



Alternatively to standard spacer tubes
cut off spacer tubes and two tie cones can be used.

Advantage: wall thickness can vary

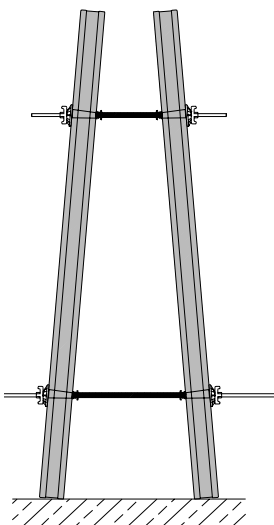
Panels 0,90 m - 2,70 m height should be anchored twice, 3,30 m height panels should be anchored 3 times.

The form of tie rod sleeves is conical, thus enabling panels to be tilted on one or both sides and offset to different heights.

The plate of combi plate has articulated joint that enables it to be fit solidly on the panel even with some inclination.

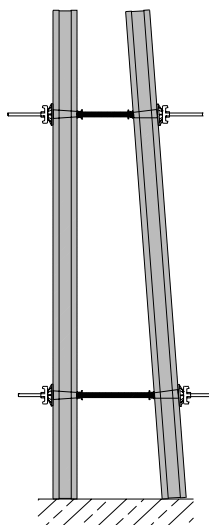
conical on both sides

max. $2 \times 4,5^\circ$



conical on one side

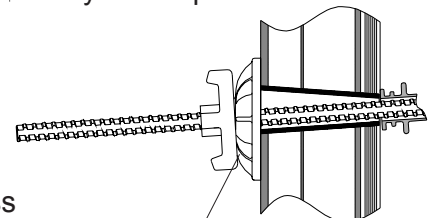
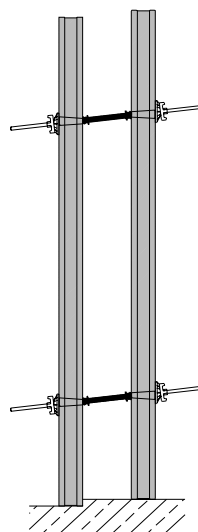
max. 4°



height offset

max. 1,0 cm

per 10 cm wall thickness



max. inclination of combi plate 10°



ATTENTION: secure all
inclined panels against uplift

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Advice: When using Steel Master panels 135 cm width
with a concrete pressure of 80kN/m^2 usage of tie rods DW 20
is recommended!

Foundation formwork

Horizontally connected panels are used for concreting of foundations. Foundation clamp and perforated foundation tape are used for anchoring.

Advantages:

no holes from anchors
little space required for installing

Measurements:

height max. 90 cm
wall thickness can be changed in step of 5 cm

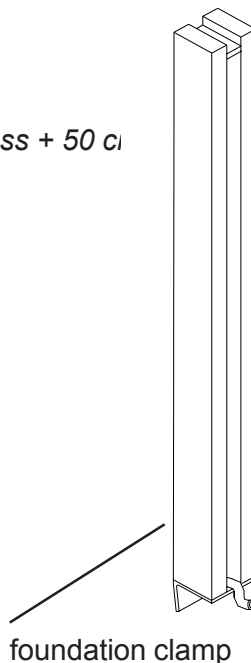
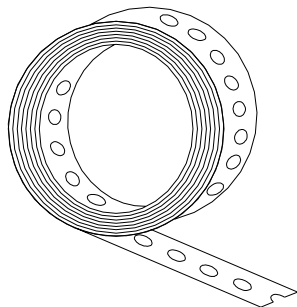
Load capacity:

perforated tape: 12kN

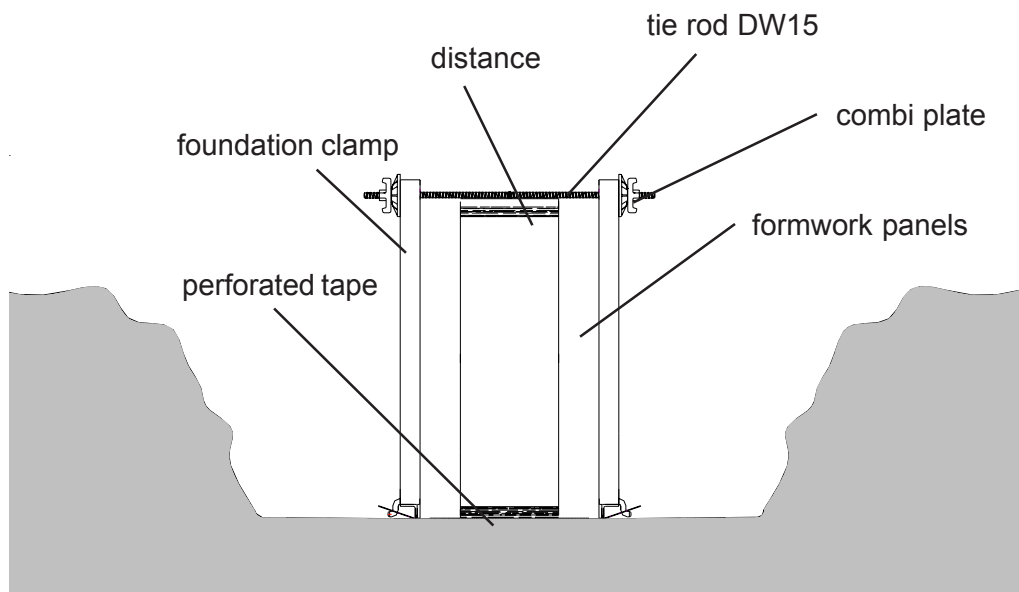
length of perforated tape = wall thickness + 50 cm

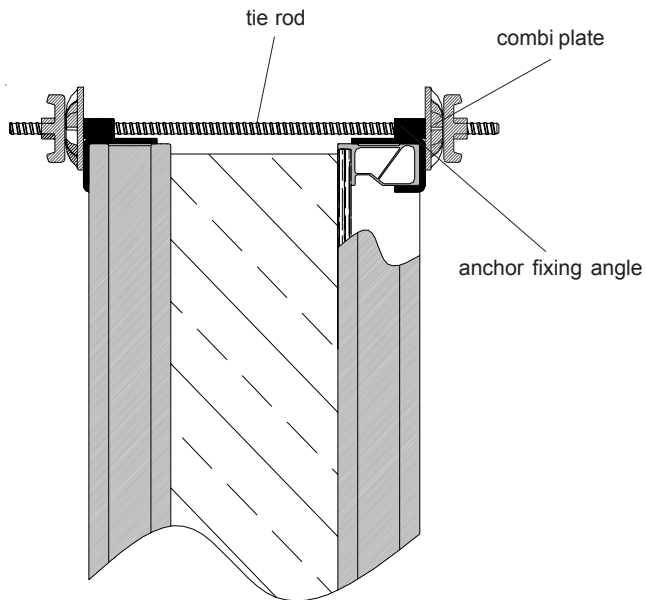
perforated tape for foundation

1 roll - 25 lm



perforated tape - foundation clamp





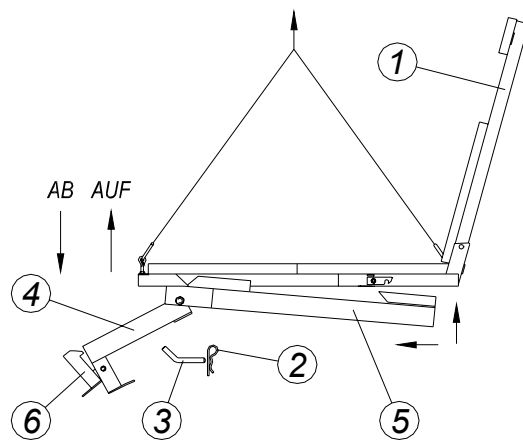
If concreting height is the same as panel height, anchor fixing angle should be used.

In case this anchor fixing angle is not used, the upper concrete layer can be too thin with standard anchoring.

Working platforms:

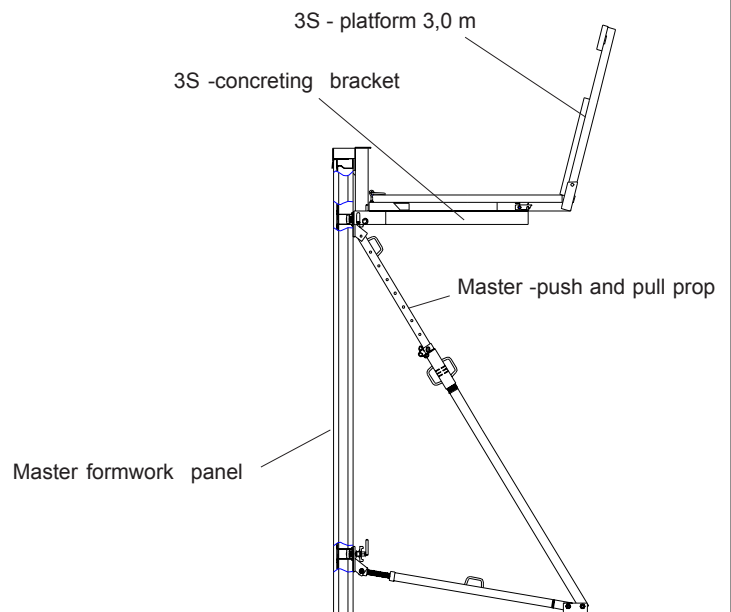
3S - concreting platform

max. load: 200 kg/m²



Montage:

1. Open 3S platform (1)
2. Remove connecting (2) and security bolt (3)
3. Tilt back vertical beam (4) (AB)
4. Fix horizontal beam (5) behind + in front and pull forwards.
5. Tilt up vertical beam(4) (AUF) and fix with connecting and security bolt.
6. Fix 3S platform with 3S concreting bracket to the formwork with bracket (6).



Please see more detailed information in Ringer „3S platform user manual“

Concreting platform „L“

Concreting platform „L“ is ready-to-use working platform of the following dimensions:

Length 2,7 m

Width 1,0 m.

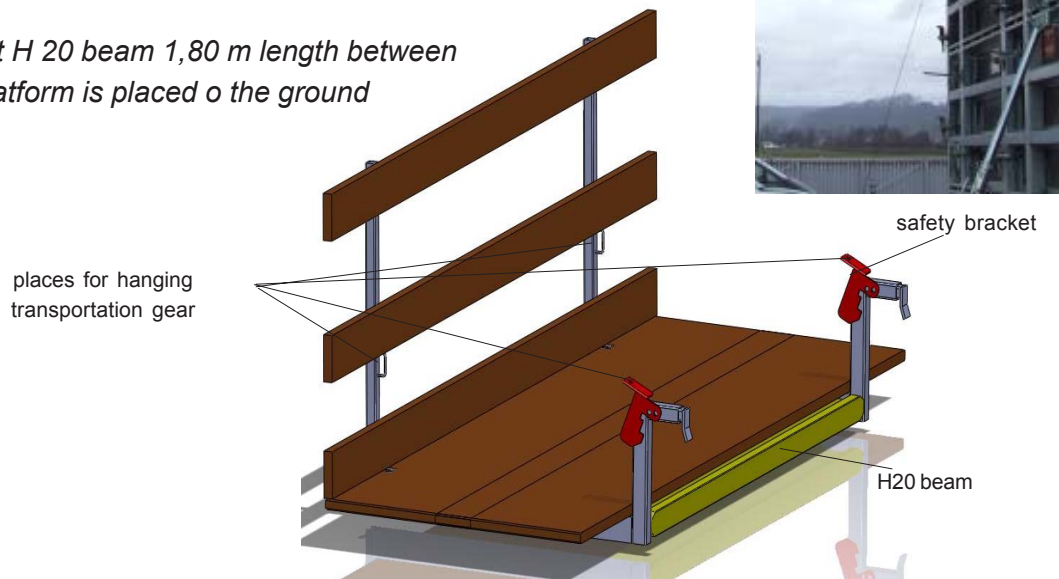
Distance between brackets 1,86 m

Load capacity: 200 kg / m²

Mounting:

- Open guardrail and fix it with bolts and spring cotters
- Hang transportation gear at safety brackets and hooks of the guardrail
- Lift the platform and hang on frame profile of panels
- Take away transportation gear, lock safety brackets

➔ **ATTENTION:** put H 20 beam 1,80 m length between brackets when platform is placed on the ground



Brackets:

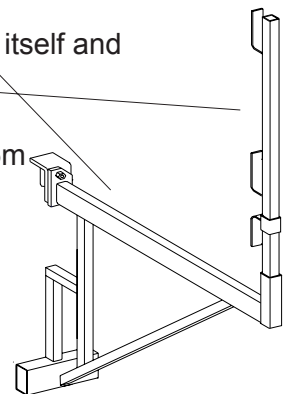


Master bracket consists of a bracket itself and a hand rail post.

Width of the bracket is 75 cm

Max. distance between brackets: 1,5m

Max load: 200 kg/m²



You can fix brackets at horizontal or vertical panels.

Make sure that no lifting of the bracket is possible!

Fix side guards!

➔ **Advice:** for safe use please follow all corresponding regulations issued by local authorities.

Push and pull props:

Master push and pull props are used to erect and to support formwork.

They make formwork stable in every phase of construction work.

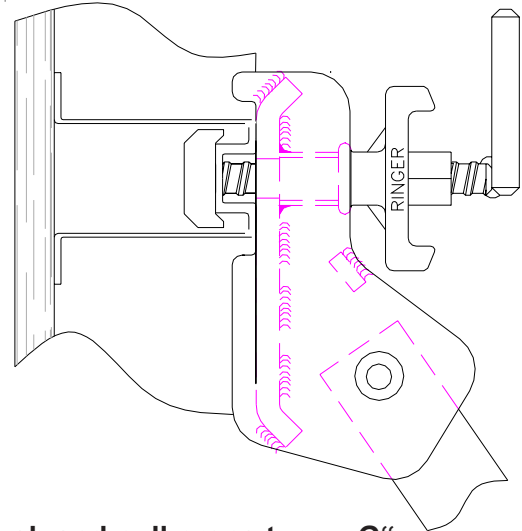
Please observe the applicable safety regulations, pay attention to wind loads

All push and pull props have to be anchored in concrete with guaranteed tensile and compression strength.

Anchoring loads: please see tables below.

For anchoring you can use for example, compact concreting nail HKD M16 from Hilti. Please follow the instructions of the producer.

There is a special place on Master panel functional profile for fixing push and pull props.



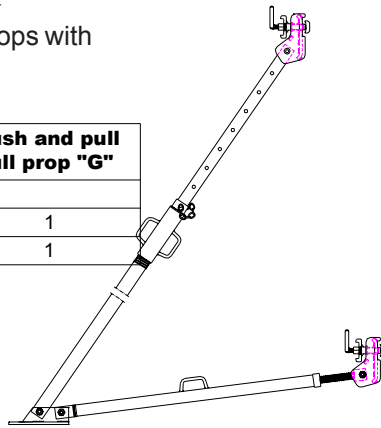
Types of Master push and pull props.

Standard push and pull props.

The adjustment of push and pull prop from 2,05 m to max. 3,55 m is possible, the maximum height of the formwork should not exceed 4,50 m.

Quantity of push and pull props with 2,70m width block of panels

Formwork-height	push and pull prop	push and pull prop "G"
3,60 m	1	
4,80 m		1
5,40 m	1	1



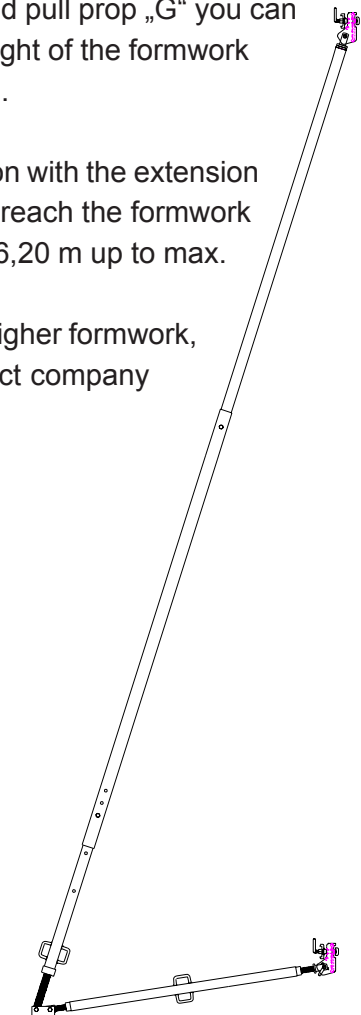
Push and pull props type „G“ :

Adjustment of push and pull props „G“ is possible from 3,50 m to max. 5,90 m.

With push and pull prop „G“ you can reach the height of the formwork up to 6,70 m.

In combination with the extension part you can reach the formwork height from 6,20 m up to max. 8,40 m.

If you need higher formwork, please contact company Ringer.



permitted loads

	length extended (m)	Compression strength (kN)	Tensile strength (kN)	Anchoring load (kN)
push and pull prop	2,05	22	18	12
	2,55	20		
	3,05	15		
	3,55	12		
push and pull prop "G"	3,50	40	40	24
	4,30	40		
	5,10	40		
	5,90	30		
	6,20	20		
	7,30	20		
	8,40	20		

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Moving by crane:

Large blocks of panels are shifted with Master crane hook.

Crane hook should be fixed at the profile of the panel in the area of the joint or in the stiffened area.

You can do that by lifting c-clamp by hand.

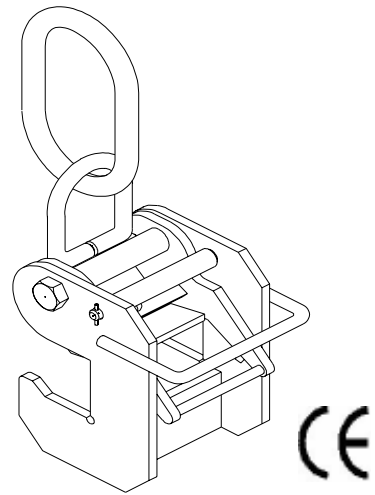


ATTENTION: by lifting up the lying panels adhere carefully the direction of load:

STRICTLY UPRIGHT

Before lifting formwork with a hook you have to control that panel profile is placed completely in the recess of the crane hook and that the bottom edge of c-clamp is on the panel profile.

Otherwise there is a danger that formwork slips out of the hook.



max load: 12kN / crane hook



ATTENTION:

The maximum load on the crane hook should not exceed 1200 kg!

Before usage check the hook for any visible damage or deformation.

Never pull the formwork with the crane from concrete, there is a danger of overloading the crane hook.

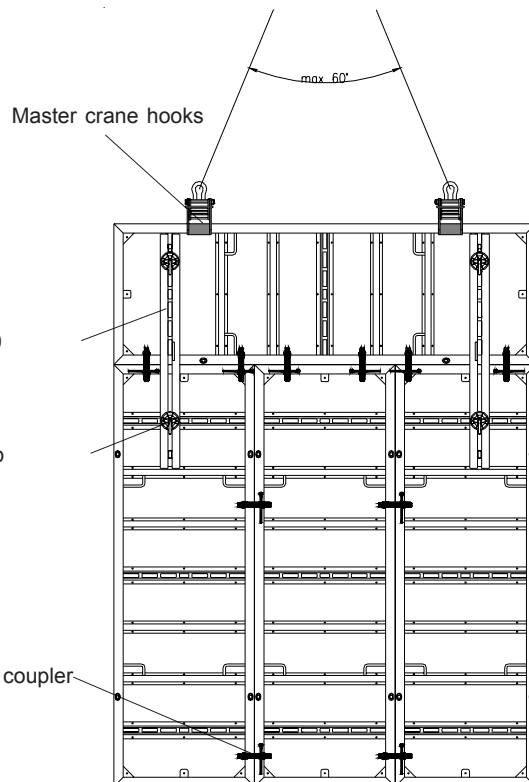
Yearly inspection of crane hooks is to be made by authorized specialist.

Master crane hook is to be fixed in the area of panel joint or stiffened area to avoid slipping out.

Suspend block of panels symmetrically (take care of centre of gravity)

Maximum possible spread of lifting tackle - 60°.

When a large block of panels is mounted on the ground, use walers 150 to stiffen to avoid further buckling of panels in the block.



Please follow the directions of User Manual !

Transportation, stacking and storage:

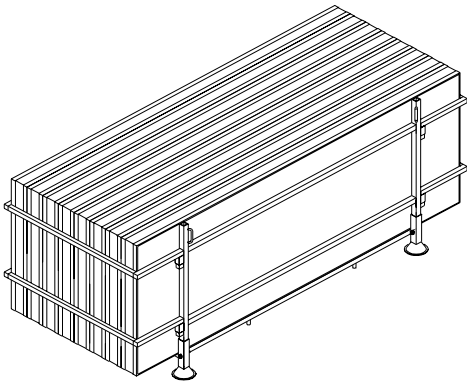
Formwork pallet

In one formwork pallet you can transport and store 8 Alu Master panels 2,70x0,9 m

For transporting panels 0,90 m and 0,75 m width you need 2 stirrups. For smaller panels take 4 stirrups.

➔ **Advice:** please follow the instruction of the data sheet

max. load: 8,0 kN

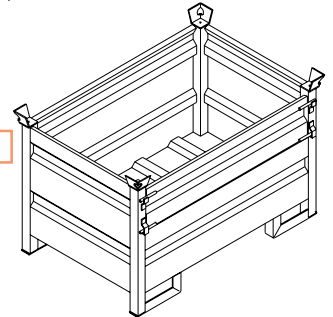


UNI - container

For transportation and storage of accessories

➔ **Advice:** please follow the instruction of the data sheet

max. load: 15 kN

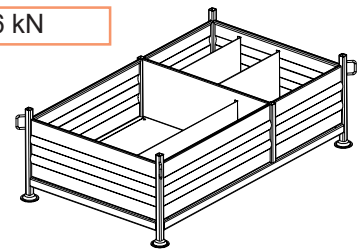


Accessory box

For all formwork accessories

➔ **Advice:** please follow the instruction of the data sheet

max. load: 16 kN



Stapos transport lifting chain.

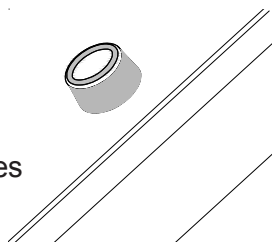
Safe transportation of Master panels.



max.load : 20 kN

➔ **Advice:** follow the instructions of Stapos data sheet!

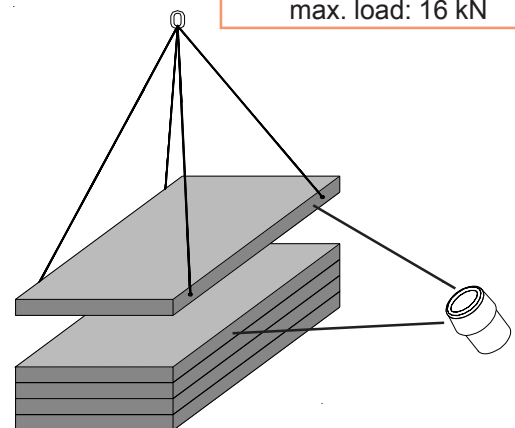
Secure panels against shifting with transport cones. Use 2 pieces per panel



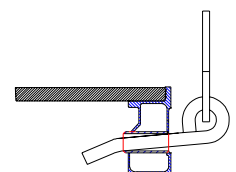
Master transport gear 3 m

For stacking and separating Master panels use Master transport gear.

max. load: 16 kN



Push transport bolt in outside hole of the panel.



Under load transport bolt secures itself.

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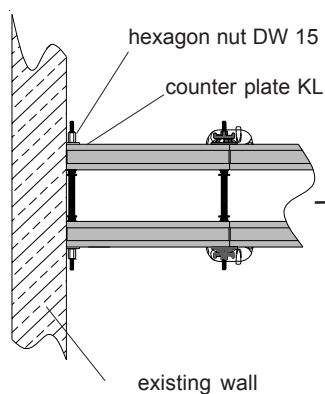
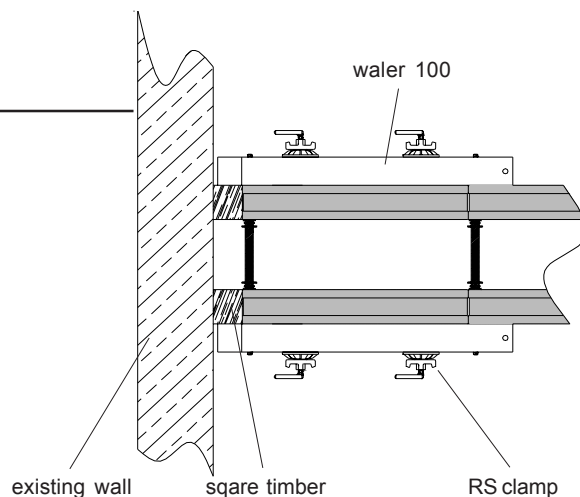
IV) Range of application:

Wall junctions, offsets:

For T-junction with square timber with panel height 2,70 - 3,3 m 3 walers 100 for each side should be used.

To be able to use combi plates, take care that minimum square timber thickness is 3 cm.

Square timbers up to 5 cm width can be used without walers.

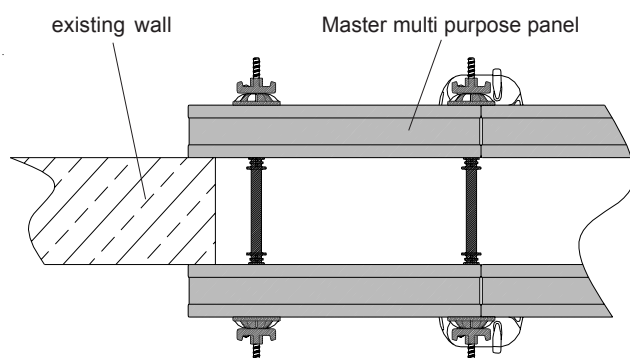
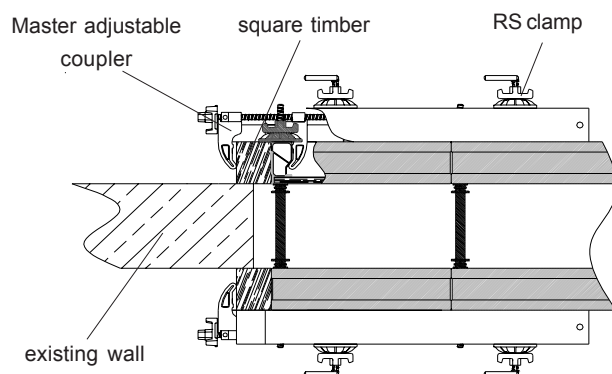
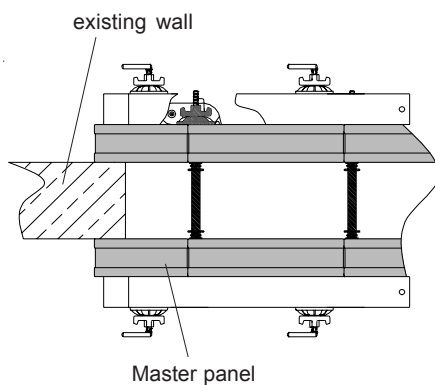


For T-junction without square timber counter plate KL + hexagon nut DW 15 should be used

In-line connections can be made with Master panels or square timber.

For panel height 2,70 - 3,3 m 3 walers and 6 RS clamps should be used.

To fix square timber additionally 2 adjustable Master couplers are required.

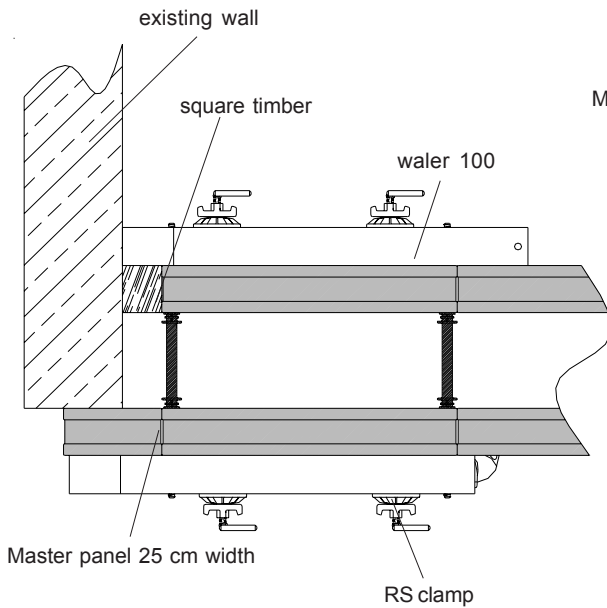
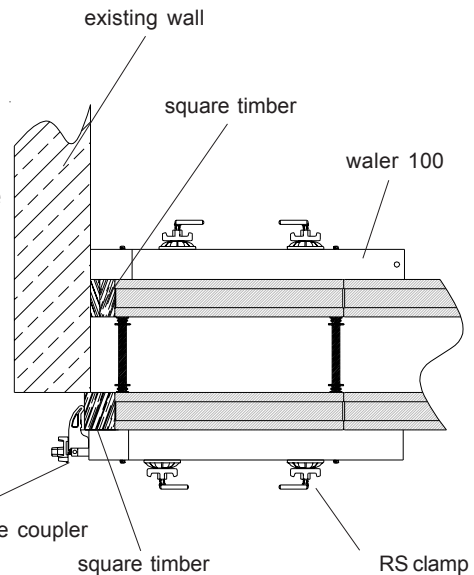


With Master multi purpose panels in-line connections are also possible

Corner connection with square timber:

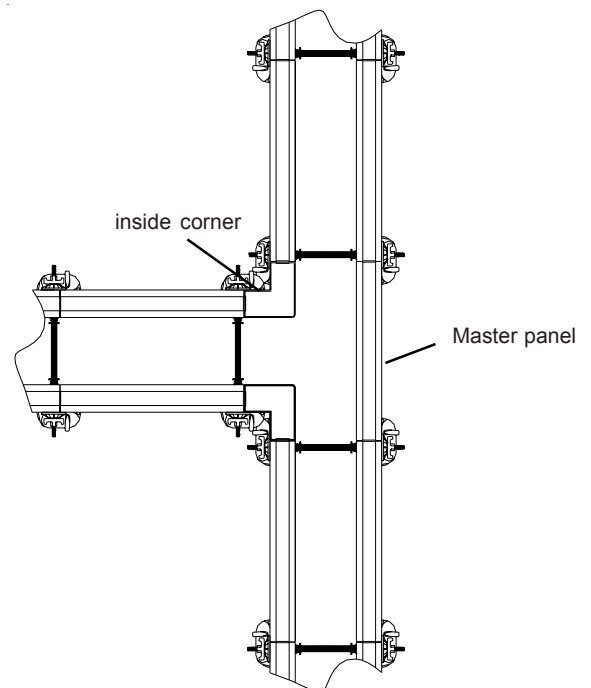
3 walers 100 and 6 RS clamps for each side with panel height 2,70 - 3,3 m are required.

When square timber is less than 5 cm thick, no walers are required, it can be fixed with 2 adjustable Master couplers

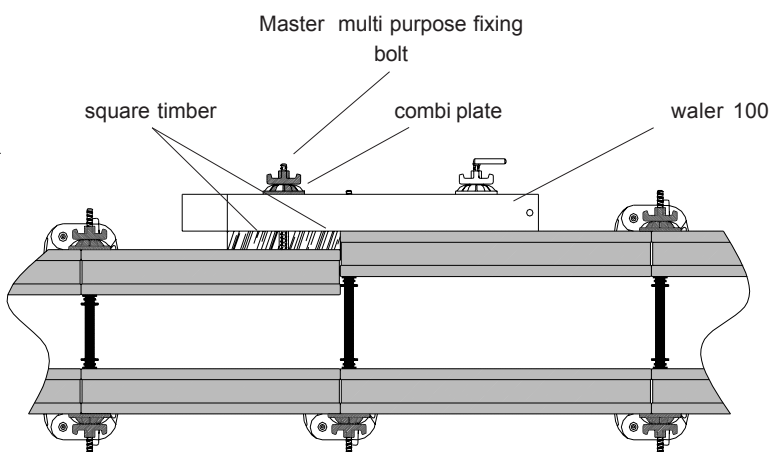


Corner connection with panels:

For this connection additionally Master panel 25 cm width should be used for length compensation.



T-junction



Wall offset of one side is possible up to max. 12 cm.

For panels height 2,70 - 3,30 m the following connecting parts are required:

- 3 walers 100,
- 3 RS clamps,
- 3 multi purpose fixing bolts and
- 3 combi plates.

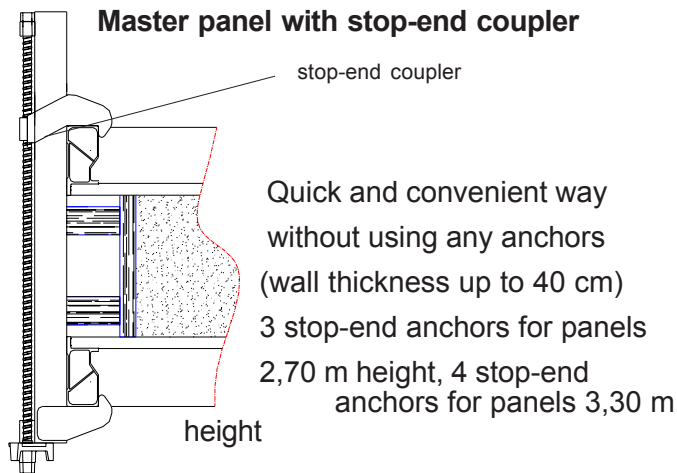
Short walls should be supported.

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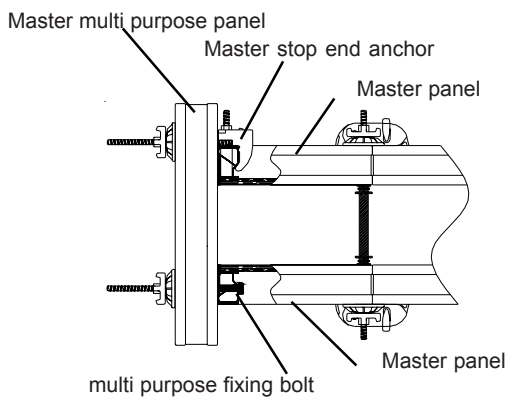
Gerüste - Baugerüste - Schalungen

Stop-end formwork

There are many options to form a stop-end with Master system.

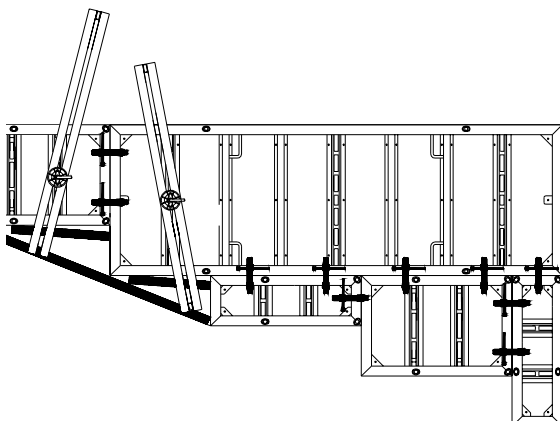


Master multi purpose panel with stop-end anchors or multi purpose fixing bolts.

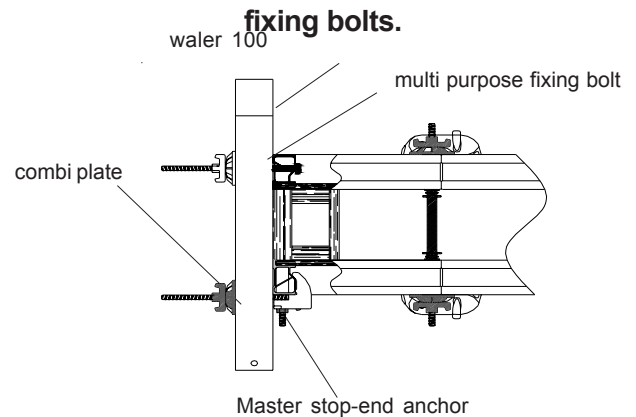


Areas that cannot be reached with panels:

With walers and RS clamps there is a possibility to cover the remaining areas simply with square timber and plywood.



Master panel with stop-end anchors or multi purpose fixing bolts.



Waler can be fixed with stop-end anchor or multi purpose fixing bolt.

They should be fixed in the middle between two cross section profiles, so that the load is spread evenly.

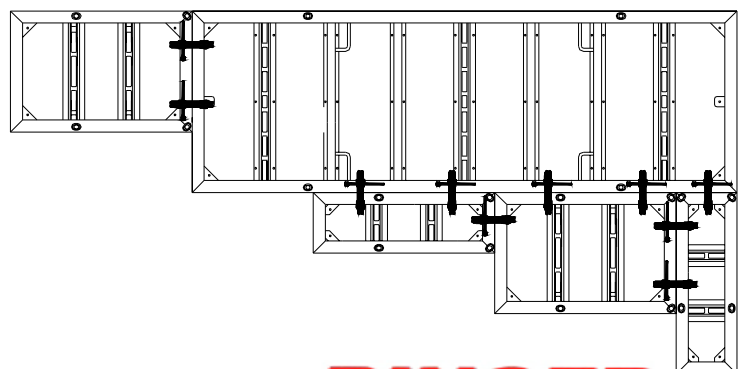
Stop-ends of panels height 2,70 m are anchored 3 times

(6 stop-end anchors/multi purpose fixing bolts, 3 walers and 6 combi plates). 3,30 m high stop-ends should be anchored 4 times.

Stepless height offsets.

Master panel profile enables connections to be fastened on each side of the frame. Thus panels of different sizes can be connected steplessly, without being confined to any grid.

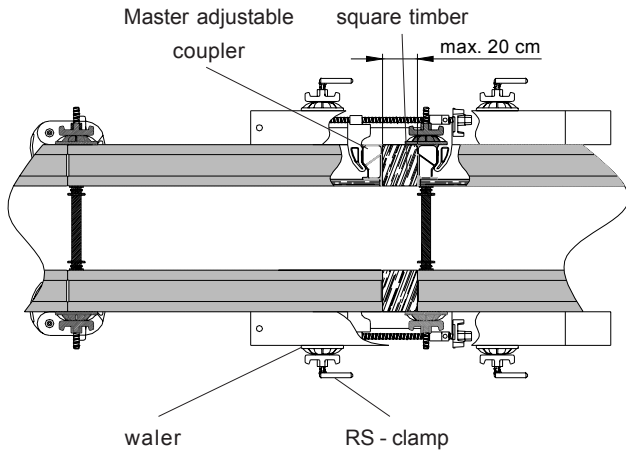
Master formwork can easily be accommodated to any shapes such as steps, slopes and uneven floors with no extra cost and time.



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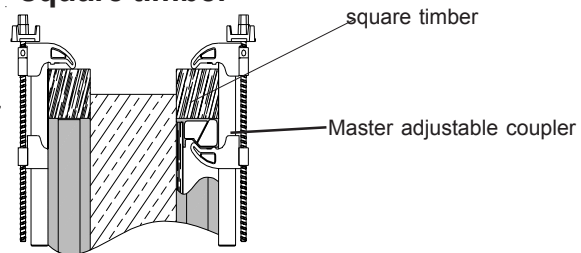
Geräte - Baugeräte - Lösungen

Compensation

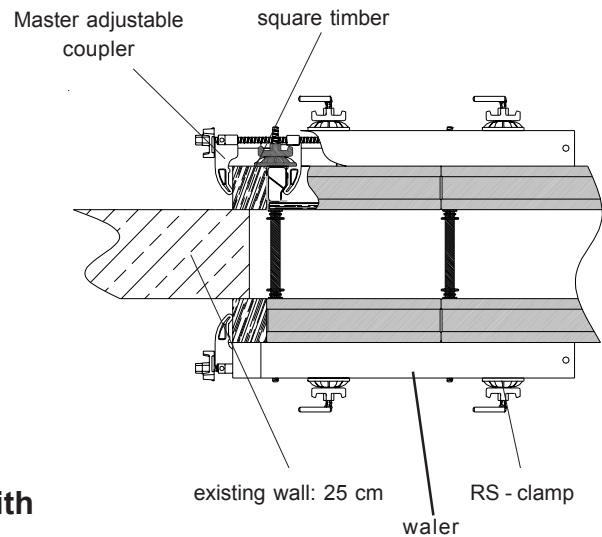


In order to extend formwork height, square timber fixed it with adjustable couplers can be used.

Build-up with square timber



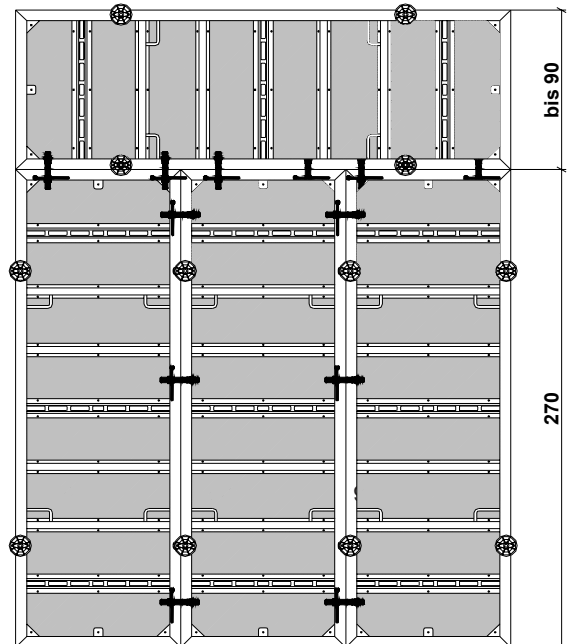
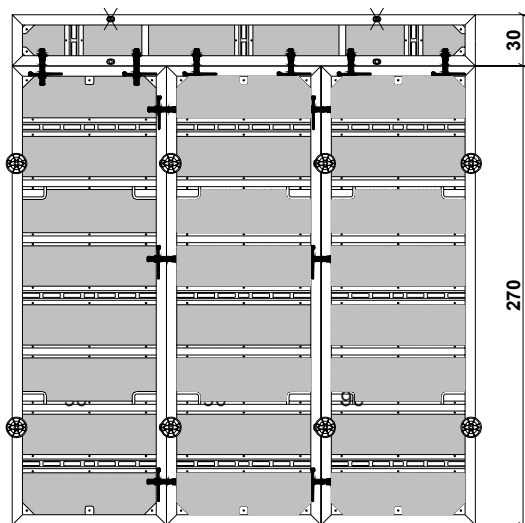
In-line connection



Rules for vertical stocking:

Formwork height: up to 3,60 m

Formwork height: up to 3,00 m



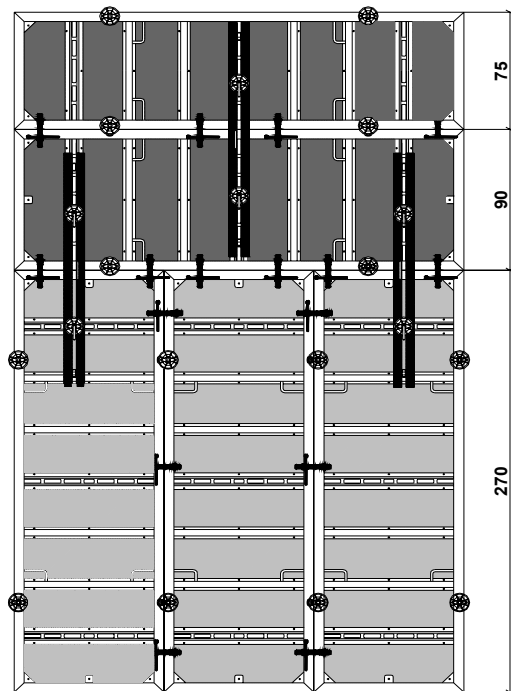
ATTENTION:

When the extension is done with more than 90 cm height, walers 150 have always to be used!!
For stocked panels 2,70 m high 3 couplers should be used

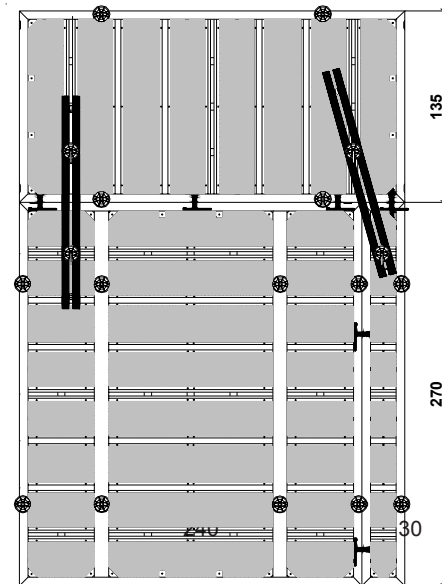
RINGER

Gerüste - Baugerüste - Schalungen

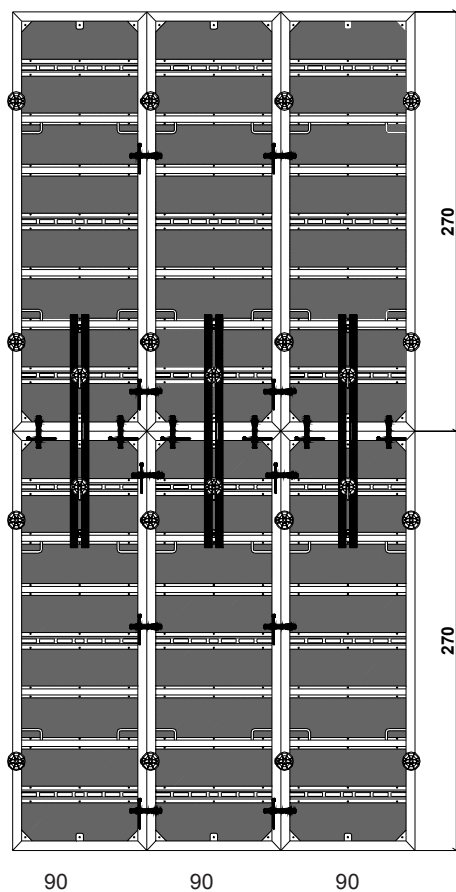
Formwork height: up to 4,80 m



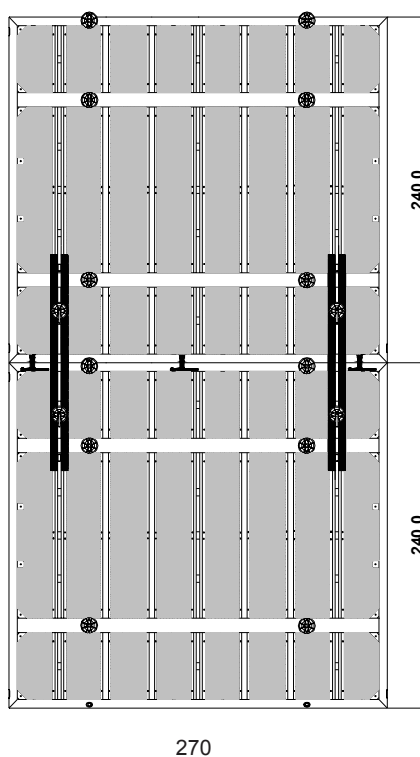
Formwork height: up to 4,05 m



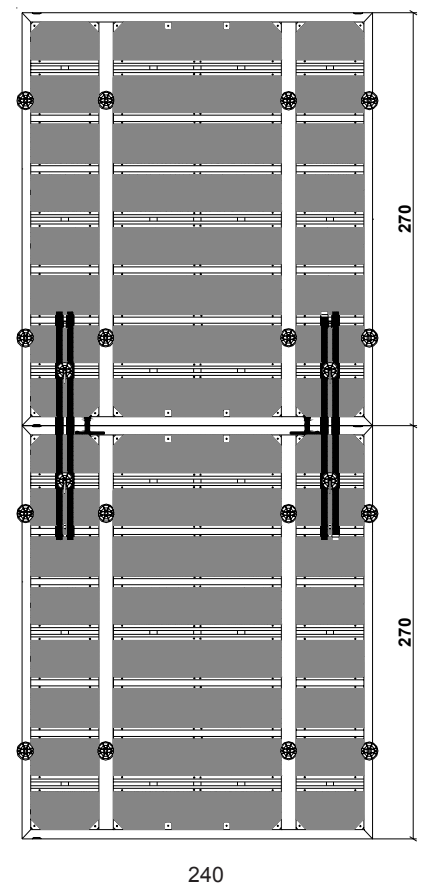
Formwork height: up to 5,40 m



Formwork height: up to 4,80 m



Formwork height: up to 5,40 m



Climbing formwork:

For climbing (installing formwork on platforms) can 3S platform and special climbing platform be used.

➔ **More details you can find in 3 S platform and climbing platform User Manuals**

1) 3 S platform



Mounting:

1. Attach nail plate with nails to the formwork plywood.
Distance to the top edge (ceiling) should be 6,0 cm + height of wooden platform
Platform should be flush with top edge of ceiling (see picture page S. 37)
2. Unscrew anchor sleeve:

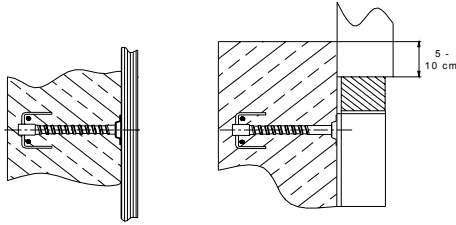


Attention: anchor sleeve DW20, ALU L = 28 cm should be fixed with concrete reinforcement in right position!

Anchor sleeve DW 20, V2A L = 17 cm with a movable part should be pushed through concrete reinforcement and fixed it in the right position!

3. Concrete.
4. Remove end shutter.
5. Screw out nailing plate with key (SW 24) .
6. Mount adaptor for climbing platform (SW 36)
7. When concrete is hardened (necessary concrete strength 10N/mm²), fix 3S platform with brackets.

Anchoring in wall



Usage of 3S platforms 2,5 m, 3,0 m and corner platforms.

Fixing:

Fixation with anchor sleeves and adaptor for climbing platform

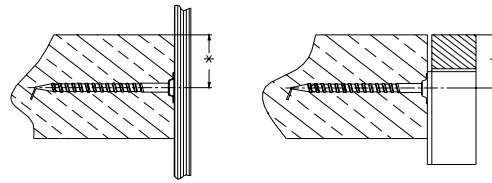
Platform without formwork support (push and pull props) (see picture to the right)

Max. load according to scaffolding group 3 200 kg/m²
Formwork height up to 5,4 m

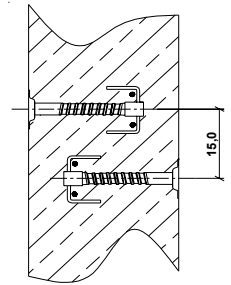
Platform with supported formwork (push and pull props) (see picture below)

Max. load according to scaffolding group 2 150 kg/m²
Formwork height up to 2,7 m

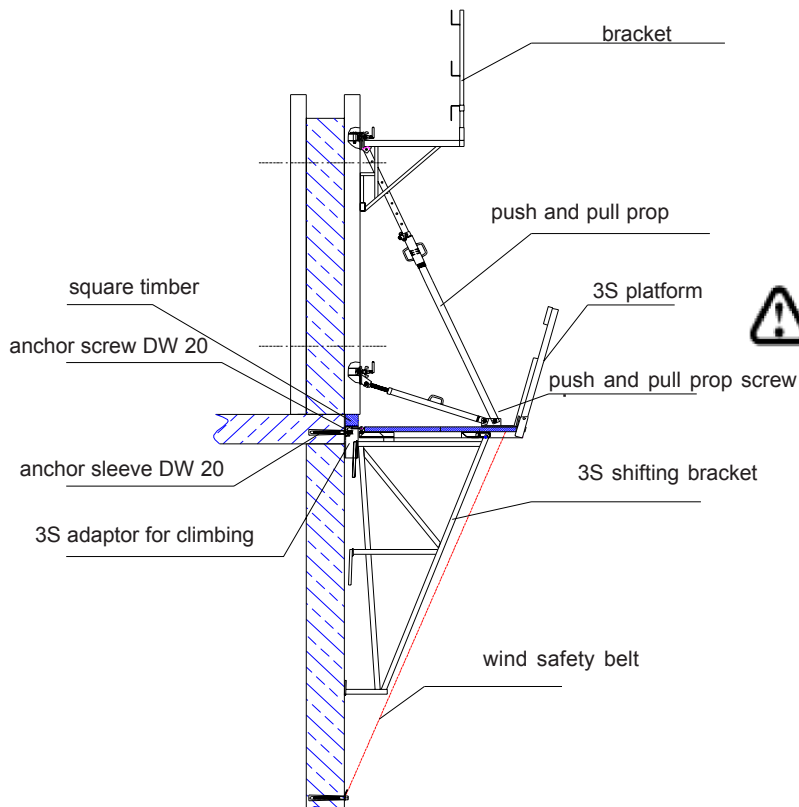
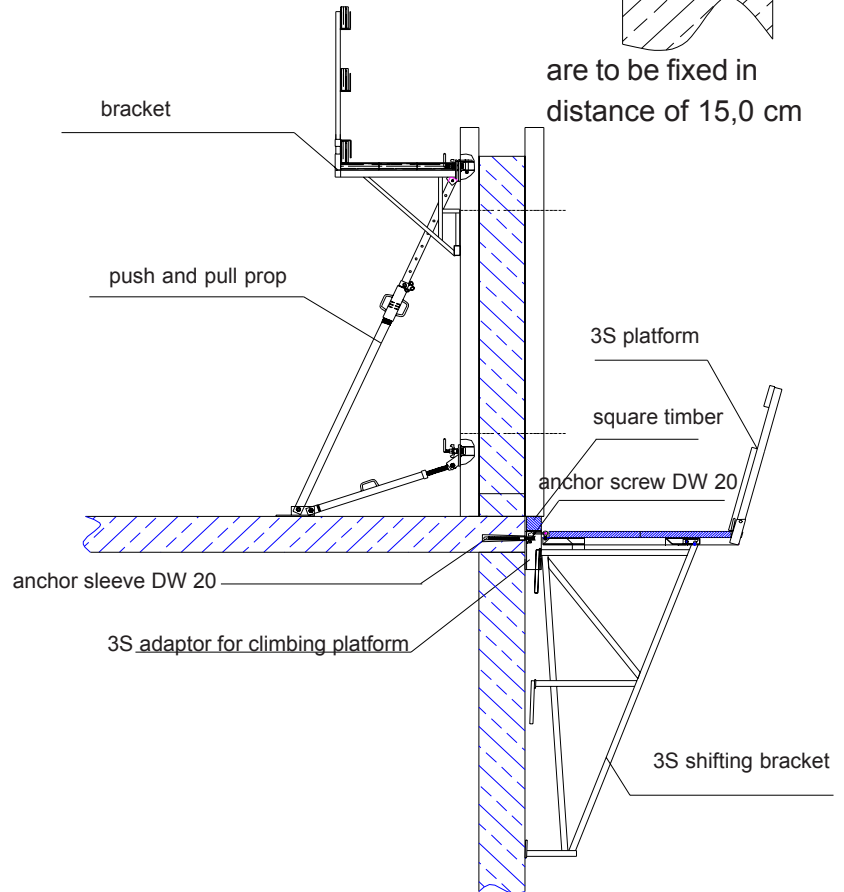
Anchoring in slab



2 anchors in wall



are to be fixed in distance of 15,0 cm



Fixation of push and pull props

Push and pull props are to be fixed with special screws for push and pull props by each 3S shifting bracket.



Attention

- Platforms have to be secured against uplift, for example with safety devices (belt) against the wind!

- You are allowed to use platforms with wind speed not more than 50 km/h
- Formwork with platforms have to be additionally supported in case of long breaks in construction, high wind speed

2) CLIMBING PLATFORM

MOUNTING:

Ringer climbing platform is installed on special cones.

Anchoring place is installed in the following way

- Fix nail plate with nails to formwork according to anchor raster
- Screw positioning cone to it
- Screw in plate anchor or pigtail anchor and connect it to reinforcement

After concreting!!

- Remove formwork
- Screw out nail plate
- Screw out positioning cone with square socket key
- Screw in climbing cone
- Hang the platform

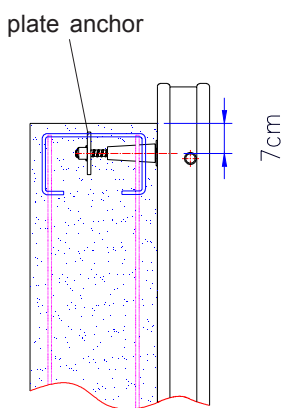


Attention:

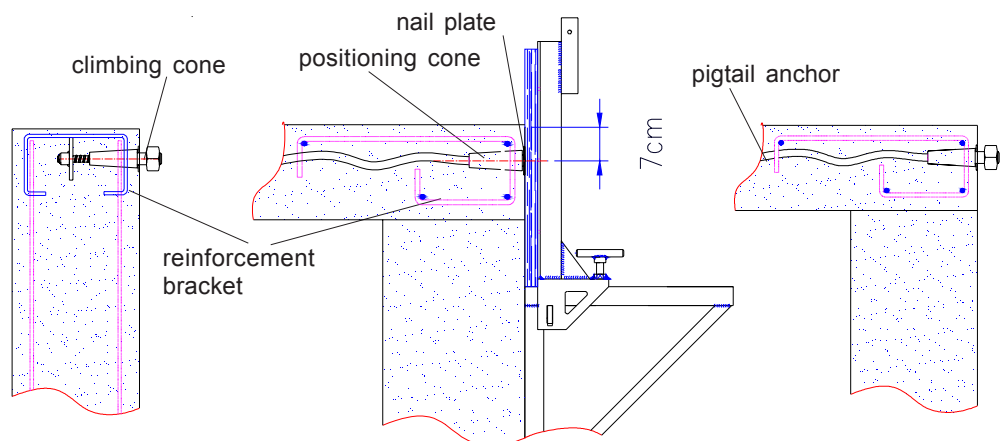
Anchoring should be done only after reaching the concrete strength of 10 N/mm²



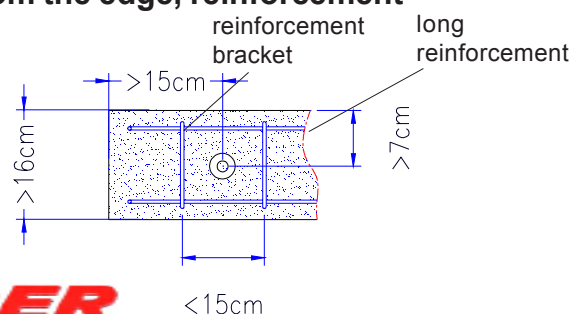
a) Wall with plate anchor



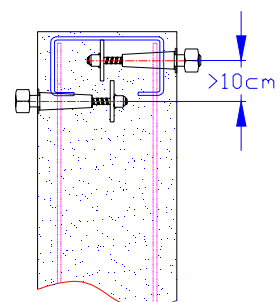
b) Slab with pigtail anchor



c) Distance from the edge, reinforcement



d) Wall with 2 anchors

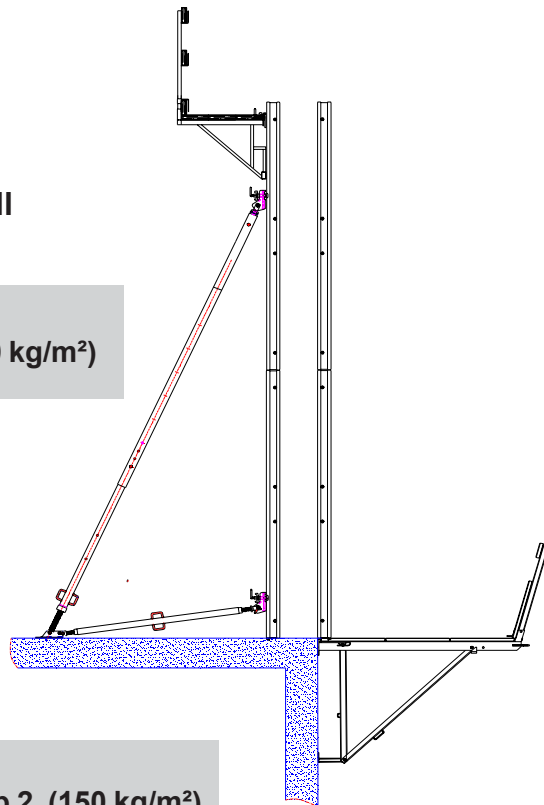


RINGER

Application area:

a) Platform without formwork support (push and pull props) (see picture to the right)

- max. formwork height: 5,4m
- max. load capacity of platform: scaffolding group 3 (200 kg/m²)



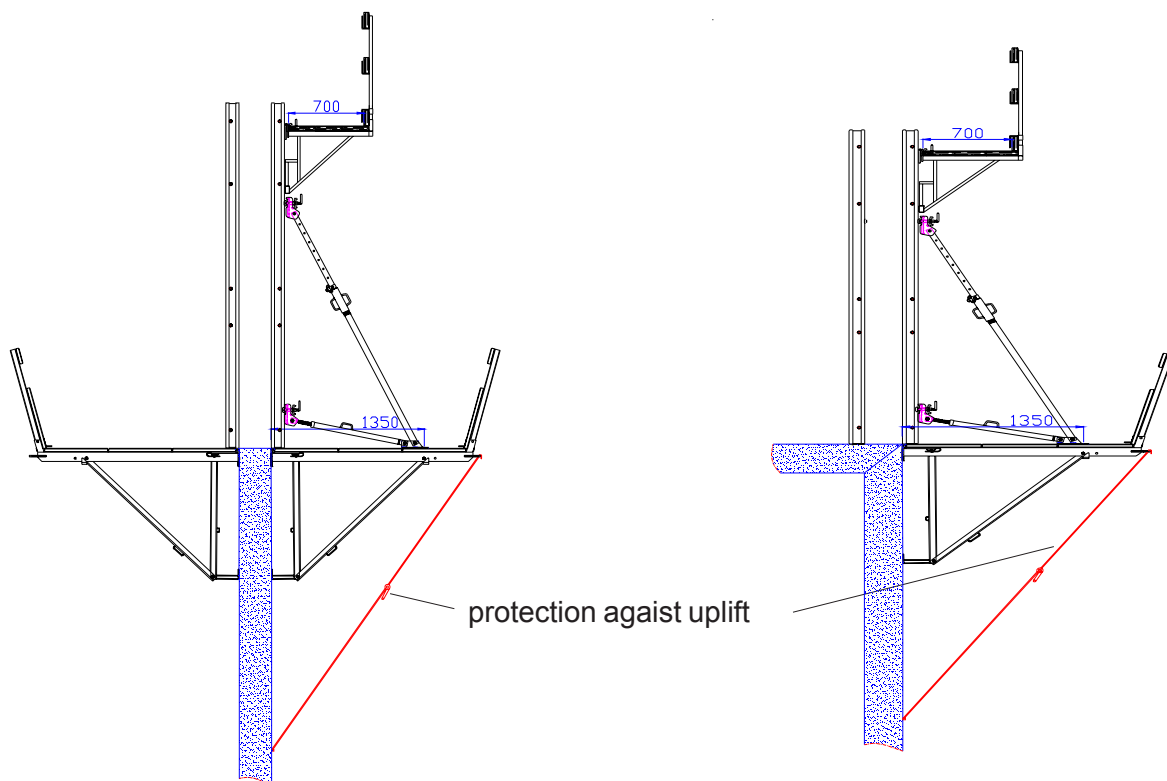
b) Platform with supported formwork (push and pull props) (see picture below)

- max. formwork height: 3,3m
- max. load capacity of both platforms: scaffolding group 2 (150 kg/m²)



ATTENTION:

- Max. wind speed (to work on the platform): 50km/h
- Platforms should be protected against uplift (for example with safety belt)
- Push and pull props should to be fixed at each bracket at interval of 1,5m



Single sided wall formwork

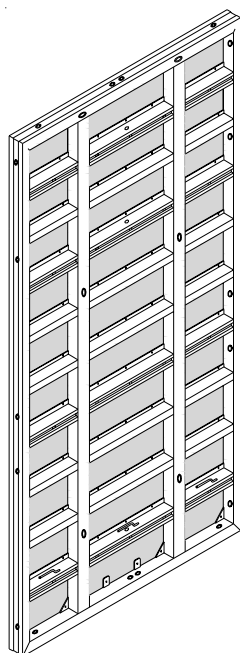
Brace frames (Supporting construction frames) „S“ and „L“ for single sided wall formwork up to 6 m height.

Please find detailed instructions in user information for Brace Frames.

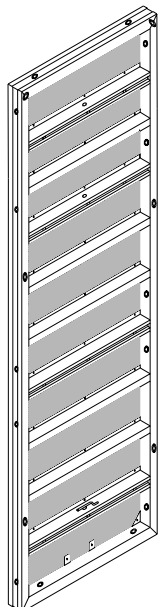


V) PANELS: Steel Master galvanized

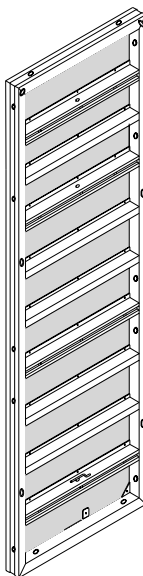
Height 330



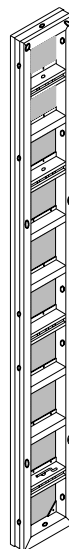
330/240



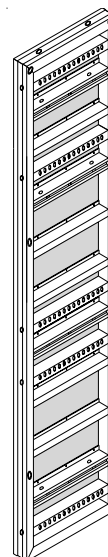
330/135



330/45-90



330/30



Multi purpose panel 330/90

With finnish plywood

item

Master panel 330/240 galvanized

Art. Nr.

805V240

weight

470,0 kg

Master panel 330/135 galvanized

805V135

238,0 kg

Master panel 330/90 galvanized

805V90

174,0 kg

Master panel 330/60 galvanized

805V60

133,0 kg

Master panel 330/55 galvanized

805V55

126,0 kg

Master panel 330/50 galvanized

805V50

120,0 kg

Master panel 330/45 galvanized

805V45

112,0 kg

Master panel 330/30 galvanized

805V30

92,0 kg

Master panel 330/25 galvanized

805V25

88,0 kg

Master multi purpose panel 330/90 galvanized

805V901

202, kg

With plastic coated plywood

item

Master panel plastic E 330/240 galvanized

Art. Nr.

E805V240

weight

486,0 kg

Master panel plastic E 330/135 galvanized

E805V135

238,0 kg

Master panel plastic E 330/90 galvanized

E805V90

174,0 kg

Master panel plastic E 330/60 galvanized

E805V60

133,0 kg

Master panel plastic E 330/55 galvanized

E805V55

126,0 kg

Master panel plastic E 330/50 galvanized

E805V50

120,0 kg

Master panel plastic E 330/45 galvanized

E805V45

112,0 kg

Master panel plastic E 330/30 galvanized

E805V30

92,0 kg

Master panel plastic E 330/25 galvanized

E805V25

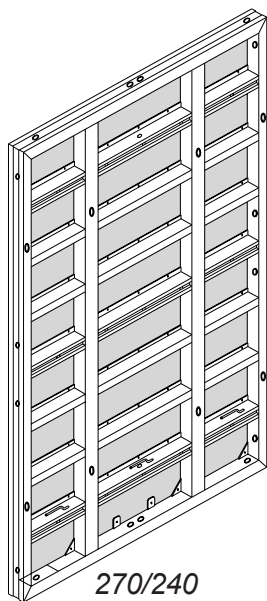
88,0 kg

Master multi purpose panel plastic E 330/90 galv.

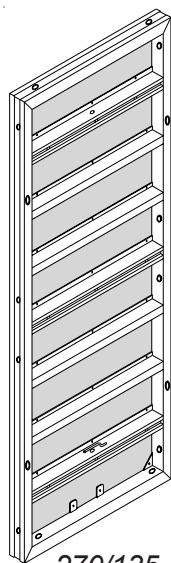
E805V751

202,0 kg

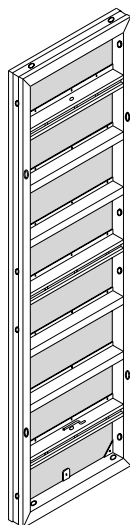
Height 270



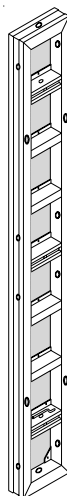
270/240



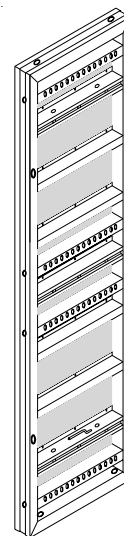
270/135



270/45-90



270/25-30



Multi purpose panel 270/90

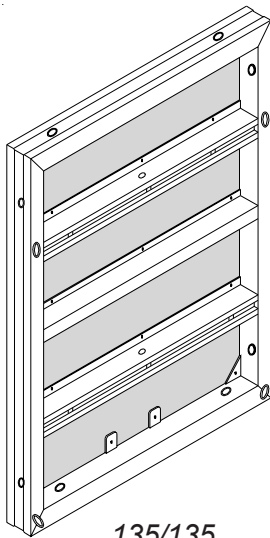
With finnish plywood

item	Art. Nr.	weight
Master panel 270/240 galvanized	801V240	385,0 kg
Master panel 270/135 galvanized	801V135	188,0 kg
Master panel 270/90 galvanized	801V90	140,0 kg
Master panel 270/60 galvanized	801V60	107,0 kg
Master panel 270/55 galvanized	801V55	99,0 kg
Master panel 270/50 galvanized	801V50	92,0 kg
Master panel 270/45 galvanized	801V45	87,0 kg
Master panel 270/30 galvanized	801V30	75,0 kg
Master -panel 270/25 galvanized	801V25	68,0 kg
Master multi purpose panel 270/90 galvanized	801V751	162,0 kg

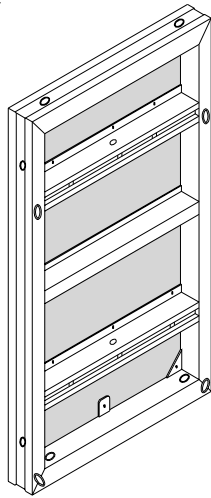
With plastic coated plywood

item	Art. Nr.	weight
Master panel plastic E 270/240 galvanized	E801V240	402,0 kg
Master panel plastic E 270/135 galvanized	E801V135	193,0 kg
Master panel plastic E 270/90 galvanized	E801V90	141,0 kg
Master panel plastic E 270/60 galvanized	E801V60	108,0 kg
Master panel plastic E 270/55 galvanized	E801V55	103,0 kg
Master panel plastic E 270/50 galvanized	E801V50	97,0 kg
Master panel plastic E 270/45 galvanized	E801V45	91,0 kg
Master panel plastic E 270/30 galvanized	E801V30	76,0 kg
Master panel plastic E 270/25 galvanized	E801V25	69,0 kg
Master multi purpose panel plastic E 270/90 galv.	E801V751	163,0 kg

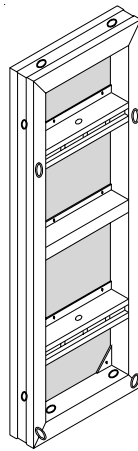
Height 135



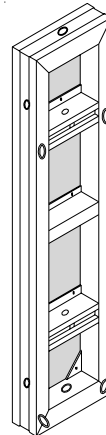
135/135



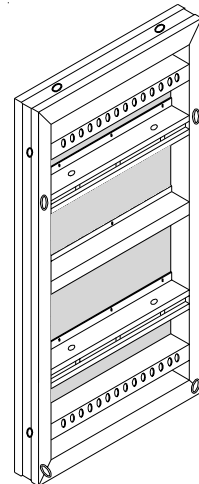
135/90



135/45-60



135/25-30



Multi purpose panel 135/90

With finnish plywood

item

Master panel 135/135 galvanized
Master panel 135/90 galvanized
Master panel 135/60 galvanized
Master panel 135/55 galvanized
Master panel 135/50 galvanized
Master panel 135/45 galvanized
Master panel 135/30 galvanized
Master panel 135/25 galvanized
Master multi purpose panel 135/90 galvanized

Art. Nr.

802V135
802V90
802V60
802V55
802V50
802V45
802V30
802V25
802V751

weight

100,0 kg
77,0 kg
59,0 kg
52,0 kg
50,0 kg
47,0 kg
38,0 kg
35,0 kg
85,0 kg

With plastic coated plywood

item

Master panel plastic E 135/135 galvanized
Master panel plastic E 135/90 galvanized
Master panel plastic E 135/60 galvanized
Master panel plastic E 135/55 galvanized
Master panel plastic E 135/50 galvanized
Master panel plastic E 135/45 galvanized
Master panel plastic E 135/30 galvanized
Master panel plastic E 135/25 galvanized
Master multi purpose panel plastic E 135/90 galvanized

Art. Nr.

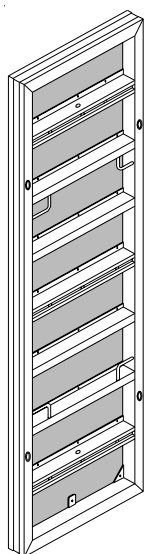
E802V135
E802V90
E802V60
E802V55
E802V50
E802V45
E802V30
E802V25
E802V751

weight

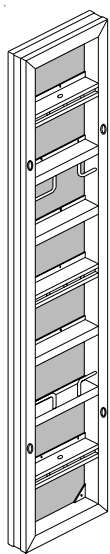
102,0 kg
75,0 kg
57,0 kg
54,0 kg
51,0 kg
48,0 kg
39,0 kg
36,0 kg
86,0 kg

PANELS: Alu-Master powder coated

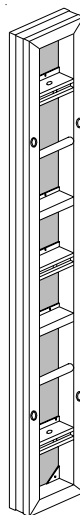
Height 270



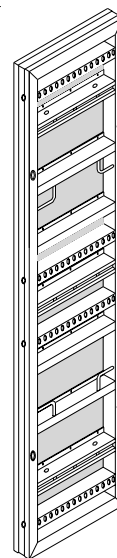
270/90



270/45-75



270/25-30



multi purpose panel 270/75

With finnish plywood

item	Art. Nr.	weight
Alu-Master panel 270/90N powder coated	701N90	64,0 kg
Alu-Master panel 270/75 powder coated	701 90	55,0 kg
Alu-Master panel 270/60 powder coated	701 60	47,0 kg
Alu-Master panel 270/55 powder coated	701 55	44,0 kg
Alu-Master panel 270/50 powder coated	701 50	41,0 kg
Alu-Master panel 270/45 powder coated	701 45	38,0 kg
Alu-Master panel 270/30 powder coated	701 30	30,0 kg
Alu-Master panel 270/25 powder coated	701 25	27,0 kg
Alu-Master multi purpose panel t 270/75 powder coated	701 751	59,0 kg

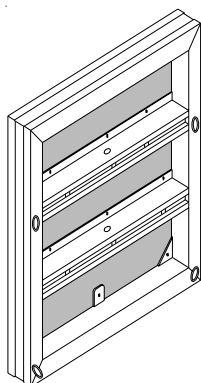
With plastic coated plywood

item	Art. Nr.	weight
Alu-Master panel plastic E 270/90N powder coated	E701N90	67,0 kg
Alu-Master panel plastic E 270/75 powder coated	E701 75	58,0 kg
Alu-Master panel plastic E 270/60 powder coated	E701 60	49,0 kg
Alu-Master panel plastic E 270/55 powder coated	E701 55	46,0 kg
Alu-Master panel plastic E 270/50 powder coated	E701 50	44,0 kg
Alu-Master panel plastic E 270/45 powder coated	E701 45	41,0 kg
Alu-Master panel plastic E 270/30 powder coated	E701 30	32,0 kg
Alu-Master panel plastic E 270/25 powder coated	E701 25	29,0 kg
Alu-Master multi purpose panel plast. E 270/75 powder coated	E701 751	59,0 kg

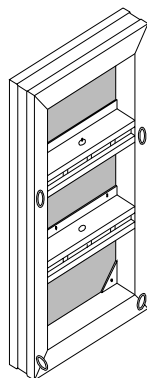
RINGER

Gerüste - Baugeräte - Schaltungen

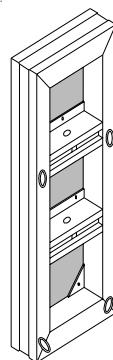
Height 90



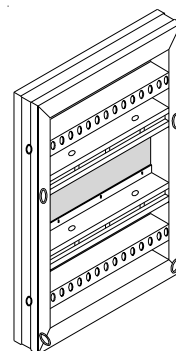
90/90



90/45-60



90/25-30



multi purpose panel 90/75

With finnish plywood

item

Alu-Master panel 90/90 powder coated
 Alu-Master panel 90/75 powder coated
 Alu-Master panel 90/60 powder coated
 Alu-Master panel 90/55 powder coated
 Alu-Master panel 90/50 powder coated
 Alu-Master panel 90/45 powder coated
 Alu-Master panel 90/30 powder coated
 Alu-Master panel 90/25 powder coated
 Alu-Master multi purpose panel 90/75 powder coated

Art. Nr.

702 90
 702 75
 702 60
 702 55
 702 50
 702 45
 702 30
 702 25
 701 752

weight

25,0 kg
 22,0 kg
 18,0 kg
 17,0 kg
 16,0 kg
 15,0 kg
 12,0 kg
 11,0 kg
 24,0 kg

With plastic coated plywood

item

Alu-Master panel plastic E 90/90 powder coated
 Alu-Master panel plastic E 90/75 powder coated
 Alu-Master panel plastic E 90/60 powder coated
 Alu-Master panel plastic E 90/55 powder coated
 Alu-Master panel plastic E 90/50 powder coated
 Alu-Master panel plastic E 90/45 powder coated
 Alu-Master panel plastic E 90/30 powder coated
 Alu-Master panel plastic E 90/25 powder coated
 Alu-Master multi purpose panel plastic E 90/75 powder coated

Art. Nr.

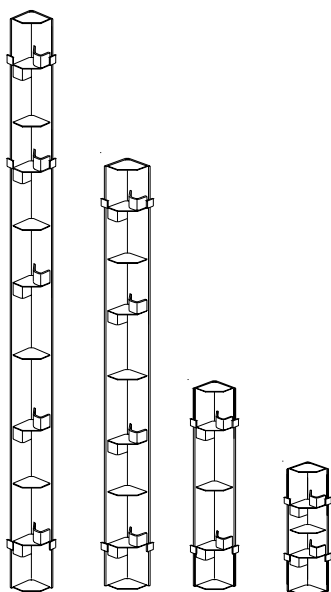
E702 90
 E702 75
 E702 60
 E702 55
 E702 50
 E702 45
 E702 30
 E702 25
 E701 752

weight

25,0 kg
 22,0 kg
 18,0 kg
 17,0 kg
 16,0 kg
 15,0 kg
 12,0 kg
 11,0 kg
 24,0 kg

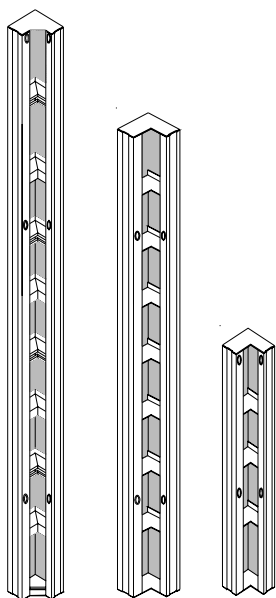
PANELS: Corners

Master - outside corners galvanized



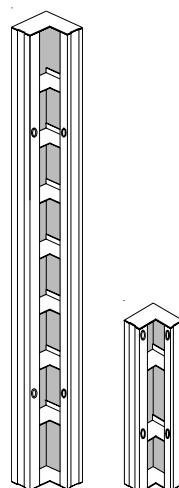
Master outside corner 330 galvanized Art.- Nr.: 703V132	weight: 48,0 kg
Master outside corner 270 galvanized Art.- Nr.: 703V13	weight:: 39,0 kg
Master outside corner 135 galvanized Art.- Nr.: 703V131	weight:: 20,0 kg
Master outside corner 90 galvanized Art.- Nr.: 703V16	weight:: 12,8 kg

Master inside corner galvanized



Master inside corner 330/30/30 galv. with plywood	Art.-Nr.: 803V51 weight 128 kg
Master inside corner 270/30/30 galv. with plywood	Art.-Nr.: 803V1811 weight 102 kg
Master inside corner 135/30/30 galv. with plywood	Art.-Nr.: 803V1221 weight 53 kg
Master inside corner 270/25/25	Art.-Nr.: 803 11 weight 110 kg
Master inside corner 135/25/25	Art.-Nr.: 703V111 weight 55 kg

Alu-Master inside corner powder coated



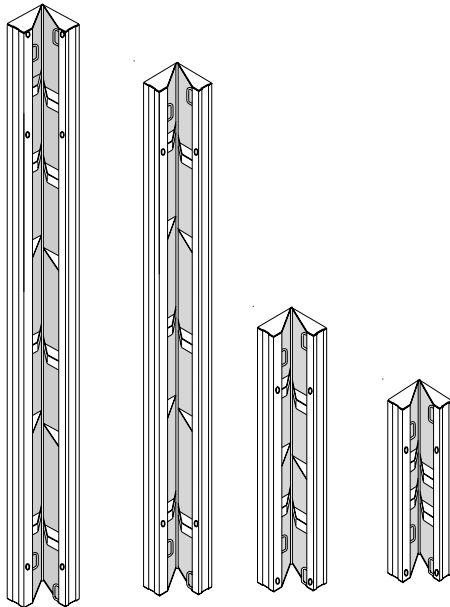
Alu-Master inside corner 270/25/25 powder coated	Art.-Nr.: 703B11 weight 41 kg
Alu-Master -inside corner powder coated with plywood 270/30/30	Art.-Nr.: 703B212S weight 46 kg
Alu-Master inside corner 90/25/25 powder coated	Art.-Nr.: 703B12 weight 16 kg
Alu-Master inside corner powder coated with plywood 90/30/30	Art.-Nr.: 703B213S weight 16 kg

RINGER

Gerüste - Baugerüste - Schaltungen

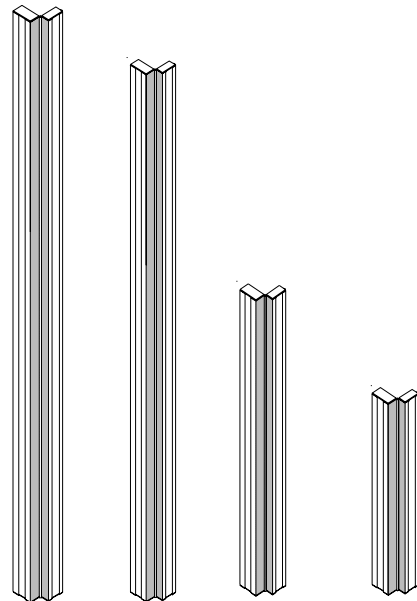
Panels: Corners

Master inside articulated corners



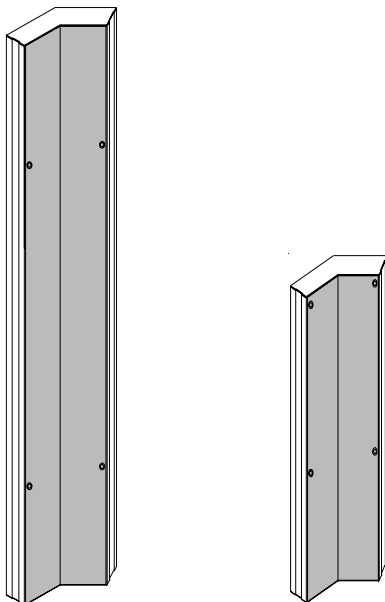
Master articulated corner I 330/30/30 Art.-Nr.: 703 014 weight: 155kg
 Master articulated corner I 270/30/30 Art.-Nr.: 703 14 weight: 110kg
 Master articulated corner I 135/30/30 Art.-Nr.: 803 24 weight: 54 kg
 Master articulated corner I 90/30/30 Art.-Nr.: 703 24 weight: 32 kg

Master outside articulated corners



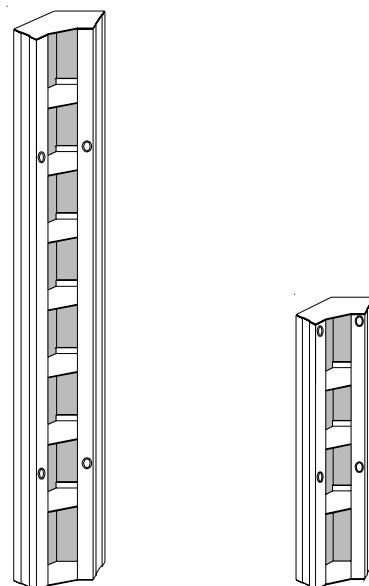
Master articulated corner A 330/6/6 Art.-Nr. 703 0141 weight: 70kg
 Master articulated corner A 270/6/6 Art.-Nr. 703 141 weight: 51kg
 Master articulated corner A 135/6/6 Art.-Nr.:803 241 weight: 26kg
 Master -articulated corner A 90/6/6 Art.-Nr. 703 241 weight: 20kg

Alu Master outside corner 135° powder coated



Alu-Master outside corner 135° 270/30/30 Art.-Nr.: 703B 19 weight: 40,0 kg
 Alu-Master outside corner 135° 135/30/30 Art.-Nr.: 703B192 weight:20,5 kg

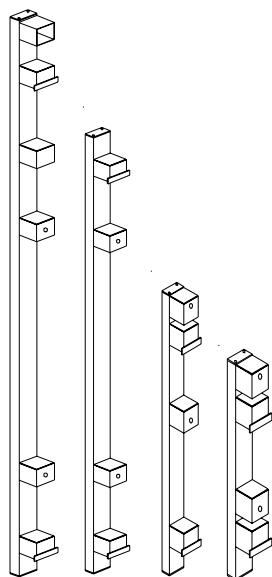
Alu Master inside corner 135° powder coated



Alu-Master inside corner 135° 270/20/20 Art.-Nr.: 703 18 weight: 40 kg
 Alu-Master inside corner 135° 135/20/20 Art.-Nr.: 703 181 weight: 14 kg

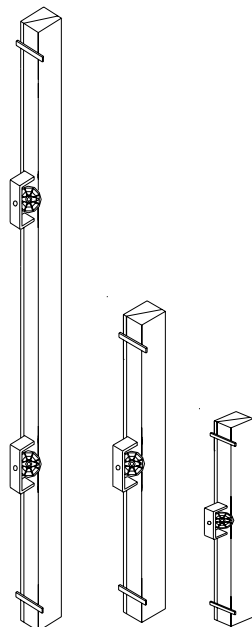
PANELS: Compensation, dismantling

Master wall thickness compensation galvanized



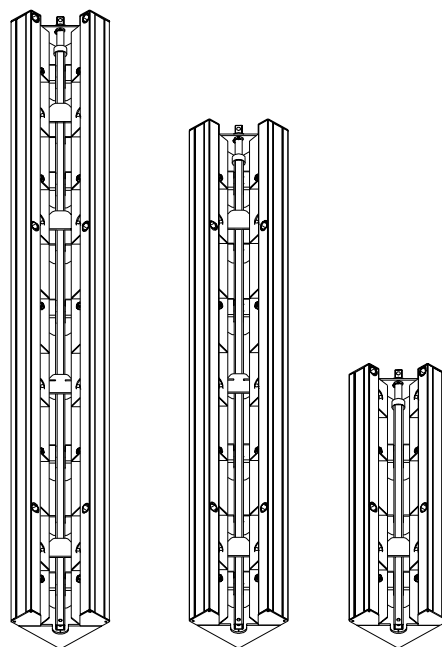
Master wall thickness compensation 330/10	Art.-Nr. 704V821	weight: 20,0 kg
Master wall thickness compensation 330/5	Art.-Nr. 704V811	weight: 17,0 kg
Master wall thickness compensation 330/3	Art.-Nr. 704V871	weight: 14,5 kg
Master wall thickness compensation 330/2	Art.-Nr. 704V881	weight: 13,0 kg
Master wall thickness compensation 270/10	Art.-Nr. 704V82	weight: 16,5 kg
Master wall thickness compensation 270/5	Art.-Nr. 704V81	weight: 14,0 kg
Master wall thickness compensation 270/3	Art.-Nr. 704V87	weight: 11,2 kg
Master wall thickness compensation 270/2	Art.-Nr. 704V88	weight: 10,5 kg
Master wall thickness compensation 135/10	Art.-Nr. 704V84	weight: 8,5 kg
Master wall thickness compensation 135/5	Art.-Nr. 704V83	weight: 7,5 kg
Master wall thickness compensation 90/10	Art.-Nr. 704V86	weight: 5,5 kg
Master wall thickness compensation 90/5	Art.-Nr. 704V85	weight: 5,0 kg

Master dismantling device galvanized



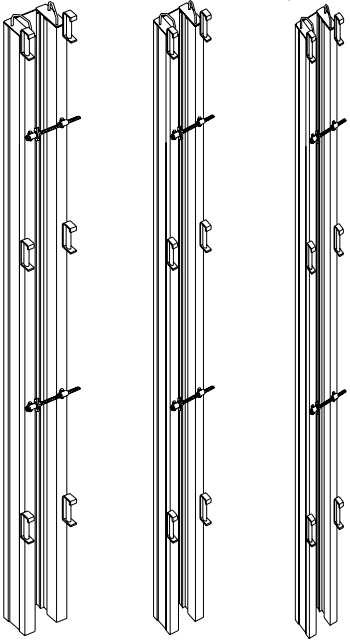
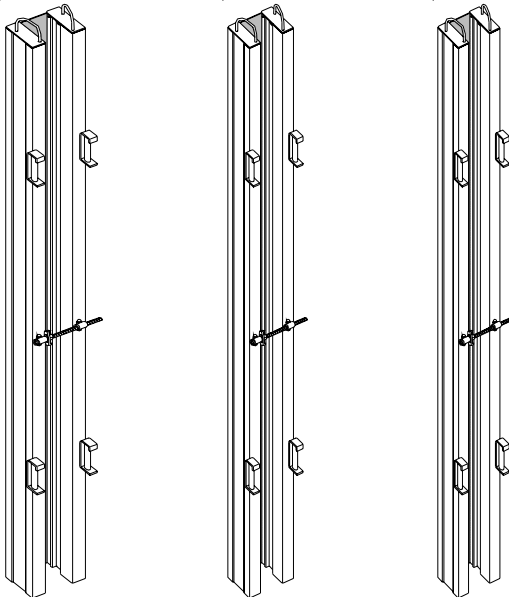
Master dismantling device 270/10	Art.-Nr. 704V9	weight: 49,5 kg
Master dismantling device 135/10	Art.-Nr. 704V10	weight: 26,0 kg
Master dismantling device 90/10	Art.-Nr. 704V11	weight: 18,0 kg

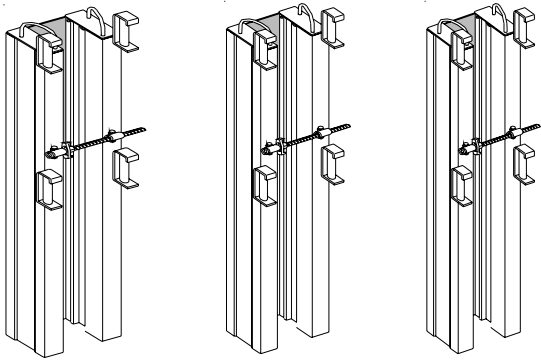
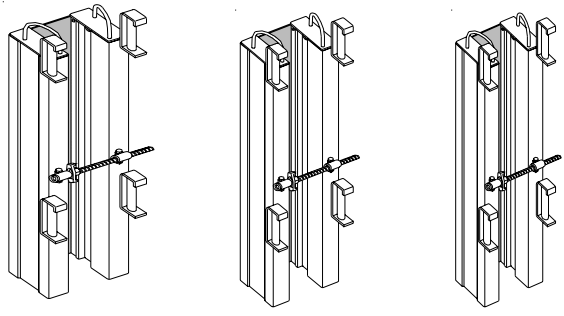
Master dismantling corner galvanized




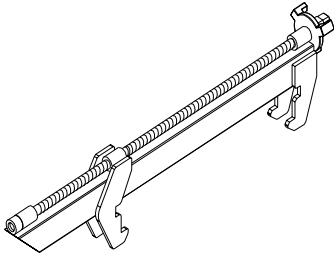
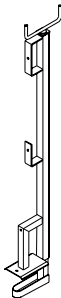
Master -dismantling corner 330/30/30	Art.-Nr. 706V3	weight: 251 kg
Master - dismantling corner 270/30/30	Art.-Nr. 706V2	weight: 202 kg
Master - dismantling corner 135/30/30	Art.-Nr. 706V1	weight: 107 kg

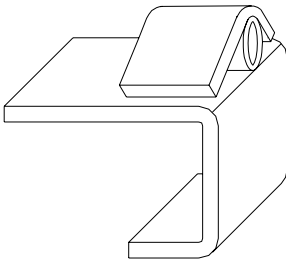
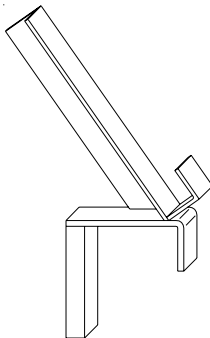
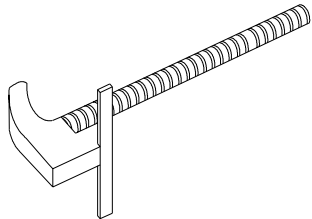
ELEMENTS: Circular forming plates

Master circular forming pate 330 galvanized			Master circular forming pate 270 galvanized		
					
Master - Bogenblech 330/30 verzinkt	Art.-Nr.: 903 30	Gewicht: 89 kg	Master circular forming plate 270/30	Art.-Nr.: 703V23	weight: 66 kg
Master - Bogenblech 330/25 verzinkt	Art.-Nr.: 903 25	Gewicht: 87,5kg	Master circular forming plate 270/25	Art.-Nr.: 703V22	weight:: 63 kg
Master - Bogenblech 330/20 verzinkt	Art.-Nr.: 903 20	Gewicht: 86 kg	Master circular forming plate 270/20	Art.-Nr.: 703V20	weight: 60 kg

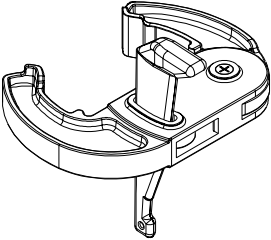
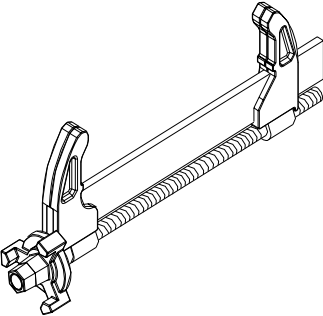
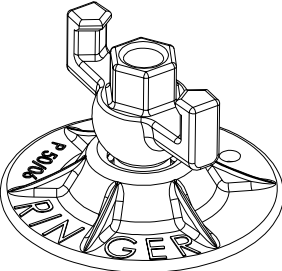
Master circular forming pate 135 galvanized			Master circular forming pate 90 galvanized		
					
Master circular forming plate 135/30	Art.-Nr.: 803V221	weight:34 kg	Master circular forming plate 90/30	Art.-Nr.: 703V231	weight: 25 kg
Master circular forming plate 135/25	Art.-Nr.: 803V211	weight: 32 kg	Master circular forming plate 90/25	Art.-Nr.: 703V221	weight: 23 kg
Master circular forming plateh 135/20	Art.-Nr.: 803V201	weight: 31 kg	Master circular forming plate 90/20	Art.-Nr.: 703V201	weight: 22 kg

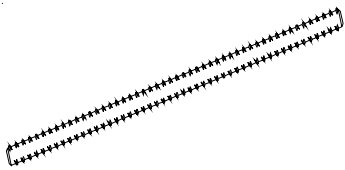
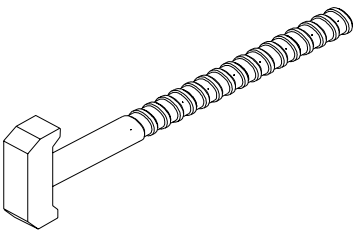
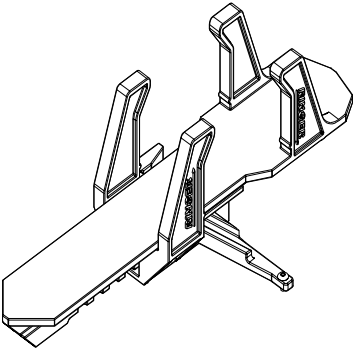
ACCESSORIES:

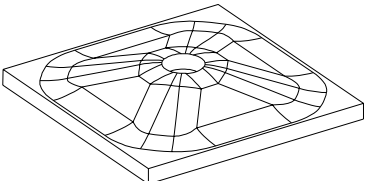
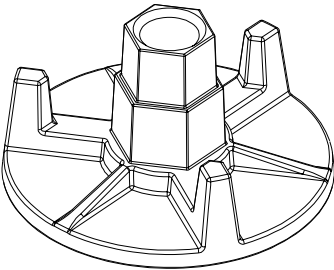
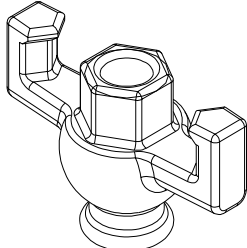
<i>foundation clamp galvanized</i>	<i>stop end coupler galvanized</i>	<i>guard rail clamp 0 - 0,60 m galvanized</i>
		
weight: 6,5 kg Art.- Nr.: 703V154	weight: : 8,3 kg Art.- Nr.: 704V69	weight: : 9,5 kg Art.- Nr.: 230V6

<i>Master anchor fixing angle galvanized</i>	<i>Master concrete fill-in help</i>	<i>Master stop end anchor galvanized</i>
		 L = 40 cm
weight: : 1,75 kg Art.- Nr.: 407V61	weight: 2,7 kg Art.- Nr.: B561	weight : 1,5 kg Art.- Nr.: 704V68

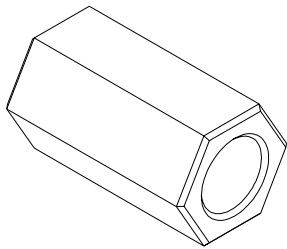
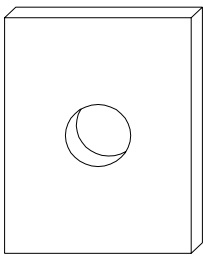
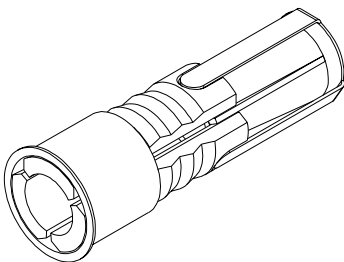
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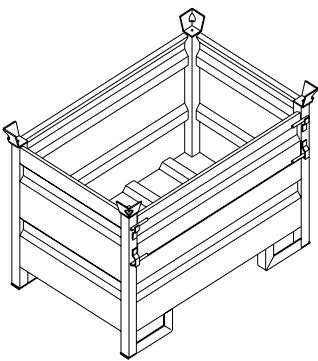
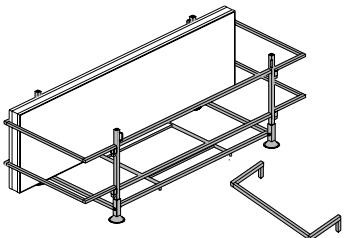
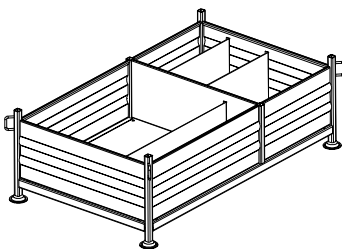
Master one hand coupler galvanized	Master adjustable coupler galvanized	Combi plate galvanized
		
weight 3,4 kg Art.- Nr.: 704V6	weight 4,7 kg Art.- Nr.: 704V61	weight 1,0 kg Art.- Nr.: 407V77

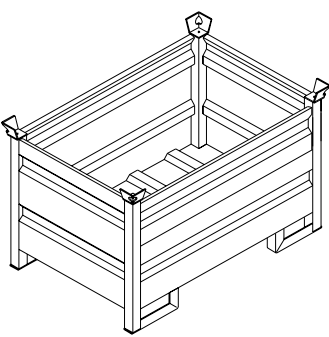

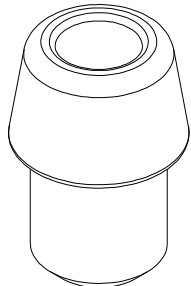
Tie rod DW15 1,00 m galvanized (other sizes available)	Master multi purpose fixing bolt galvanized	Master adjustable trueing coupler galvanized
	 L = 30 cm	
weight : 1,5 kg Art.- Nr.: 407 100	weight : 0,6 kg Art.- Nr.: 705V1	weight : 5,6 kg Art.- Nr.: 704V72

Counter plate 120x120x8 mm galvanized	Wingnut counter plate galvanized	Wingnut galvanized
		
weight : 0,9 kg Art.- Nr.: 407V73	weight 0,6 kg Art.- Nr.: 407V75	weight : 0,3 kg Art.- Nr.: 407V71

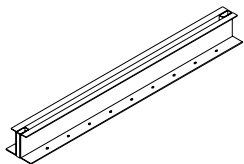
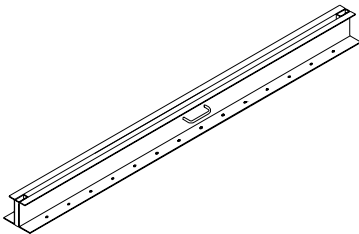
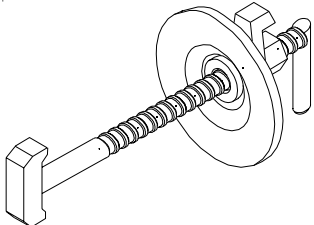
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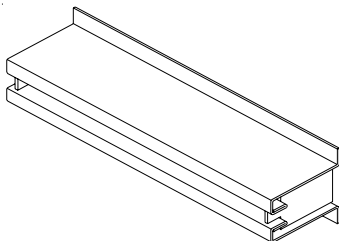
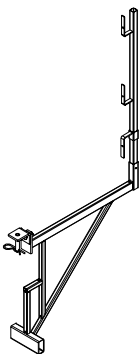
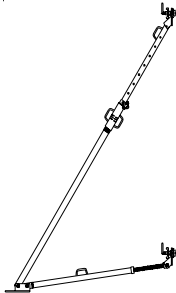
Hexagon coupler DW15 galvanized	Counter plate KL galvanized	Rock anchor 34-35mm
		
weight: 0,2 kg Art.- Nr.: 407V8	weight: 0,29 kg Art.- Nr.: 404V52	weight: 0,37 kg Art.- Nr.: 407 60

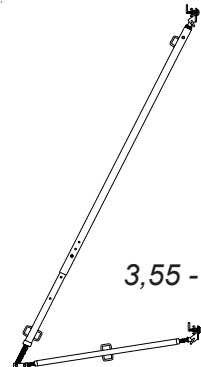
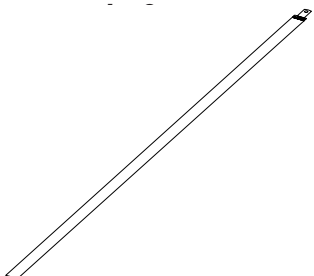
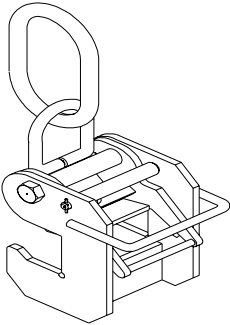
UNI - container with flap galvanized	Pallet for Alu formwork galvanized	Accessory box galvanized
	 + stirrup for pallet galvanized weight 4,2 kg Art.- Nr.: 408V91	
weight: 72,0 kg Art.- Nr.: 260V10	weight 80,0 kg Art.- Nr.: 408V90	weight: 160,0 kg Art.- Nr.: 260V0006

UNI - container without flap galvanized	Master lifting device with 4 chains 3m	Master stacking cones for panels
		
weight : 70 kg Art.- Nr.: 260V11	weight: 15,0 kg Art.- Nr.: 708 41	weight: 0,2 kg Art.- Nr.: 708 421

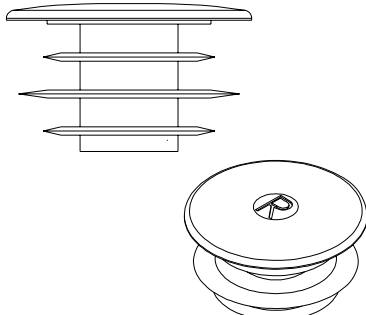
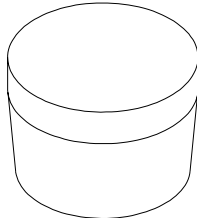
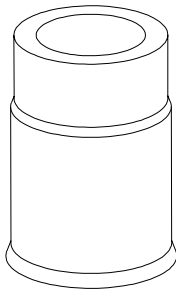
ACCESSORIES:



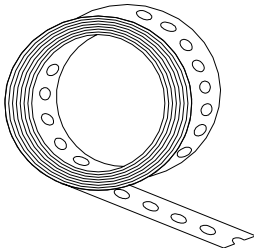
Waler 100(90) galvanized	Waler 150 galvanized	RS clamp galvanized
		
weight: 12,8 kg Art.- Nr.: 703V151	weight: 20 kg Art.- Nr.: 703V152	weight: 1,3 kg Art.- Nr.: 704V5

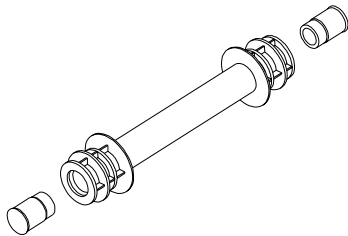
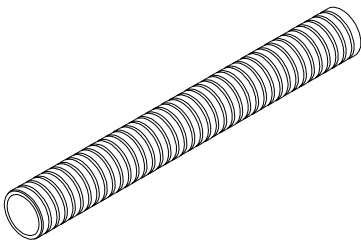
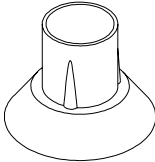
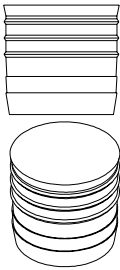
UNI waler 40 galvanized	Complete Master bracket galvanized	Push and pull prop galvanized
		 von 2,05 - 3,55 m
weight: 4,9 kg Art.- Nr.: 407V94	weight: 9,5 kg Art.- Nr.: 708V1	weight: 29,5 kg Art.- Nr.: 708V3

Push and pull prop G galvanized	Extension for push and pull prop G galvanized	Master crane hook galvanized
 3,55 - 5,90 m	 6,30 - 8,40 m	
weight: 70,0 kg Art.- Nr.: 708V31	weight: 22,0 kg Art.- Nr.: 708V34	weight: 10,0 kg Art.- Nr.: 708V4

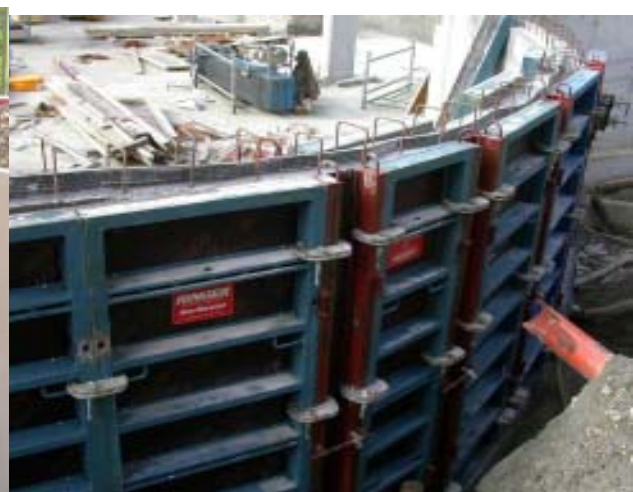
ACCESSORIES:

Uni tie cones φ 20 - 25 mm grey	Tie cones ø 24 mm brown	Cones for spacer tube
		
per pack : 500pcs. weight: 3 g Art.- Nr.: 441 13	for multi purpose panel per pack 200pcs. weight 3 g Art.- Nr.: 441 14	per pack : 100pcs. weight 3 g Art.- Nr.: 441 15

Syringe for release agent	Release agent (25 Liter)	Perforated tape 1 roll 25 rm
		
weight 5,0 kg Art.- Nr.: 408 8	weight: 22,5 kg Art.- Nr.: 450 1	for foundation formwork weight 37,5 kg Art.- Nr.: 407 500

Spacer tube WD 25 (WD 15 bis WD 40 available)	Spacer tube φ 20/25 mm lenght 2 m	Tie cone φ 20 mm	Tie cone ø 20 mm black
			
per pack: 50pcs. weight: 0,09 kg Art.- Nr.: 441 4	per pack 200pcs. weight: 0,44 kg Art.- Nr.: 441 31	per pack 500pcs. weight: 5 g Art.- Nr.: 441 2	per pack 500pcs. weight 2 g Art.- Nr.: 441 1

VI) EXAMPLES:



With **RINGER Master** wall formwork you have really

strong system



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